

ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 11

Number 7

July 2020



Indian Journal of Public Health Research & Development

An International Journal

Website:

www.ijphrd.com

Indian Journal of Public Health Research & Development

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Print-ISSN: 0976-0245-**Electronic-ISSN:** 0976-5506, **Frequency:** Quarterly
(Four issues per volume)

Indian Journal of Public Health Research & Development is a double blind peer reviewed international journal. It deals with all aspects of Public Health including Community Medicine, Public Health, Epidemiology, Occupational Health, Environmental Hazards, Clinical Research, and Public Health Laws and covers all medical specialties concerned with research and development for the masses. The journal strongly encourages reports of research carried out within Indian continent and South East Asia.

The journal has been assigned International Standards Serial Number (ISSN) and is indexed with Index Copernicus (Poland). It is also brought to notice that the journal is being covered by many international databases. The journal is covered by EBSCO (USA), Embase, EMCare. The journal is now part of DST, CSIR, and UGC consortia.

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Editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Published at

Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)



Indian Journal of Public Health Research & Development

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Nutritional Status of School Going Children in Government Primary Schools of Varanasi

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Abstract

Background: Nutrition is one of the most essential things of life. It plays a crucial role in body growth, development and maintenance of health. The objective of this study is the study of the impact of the mid-day meal scheme on the nutritional status of school children (6-12 years) in Varanasi District.

Methodology: This study was conducted for 320 students of class 1-8 at five government primary schools in two educational blocks in Varanasi district. Simple random sampling was used for selection of children. The variables of the study were the height and weight of selected students.

Results: The results of the study indicated that the nutritional status of MDM children. The study undertaken on a representative and adequate sample of Varanasi revealed that as per Waterlow classification, around 45 per cent of children were found to be normal as per their weight for age and 72.8 per cent of children were found to be normal as per their height for age. The prevalence of wasting and stunting in these children was high (55 % wasted and 27 % of stunted), with boys and girl suffering almost equally. The observations of the present study suggest that the distribution of height of boys were found shorter than boys of WHO standards by -1.8 cm to -6.4 across all ages. The maximum difference was found in age group of 13 years. The weight of boys increased with in age from 6 to 14 years. The weight in the age group 6 to 14 years ranged from 19.5 kg to 50.4 kg in boys.

Conclusion: The overall findings of the study revealed that the mean weight of boys and girls was found shorter than boys and girls of WHO standards. There was no significant difference in the prevalence of stunting and wasting for both boys and girls

Keywords: Nutritional Status, Anthropometry, Mid-Day Meal Scheme, Malnutrition.

Introduction

School age is the active growing phase of childhood. The Mid-Day Meal (MDM) scheme is the largest school lunch scheme in our country. It has been found that mid-day meal scheme has provided to the nutritional needs

of school going children in both rural and urban areas¹. Primary school age is a crucial period of physical growth as well as of mental skill development of the child. In India, the health and nutritional status of school going children is unsatisfactory in the current scenario². For the mental and physical growth of the child, childhood is the most crucial age. Nutritional food is required for the proper growth of the child. The problem of malnutrition is caused by a child does not get adequate food with proper nutrition. This scheme attracted many children from rural and urban areas mostly the girl child who was deprived of Education³.

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According to the WHO malnutrition through continues to be a major health problems in South East Asian regions⁴. The main nutritional problems facing the school children include growth retardation, stunting, underweight, anaemia, and vitamin A deficiency. There are no other efforts for children in the age group of 5-14 years, apart from the mid-day meal scheme which is being run by the government of India in government schools⁵. Nutrition plays a vital role in the promotion of health and prevention of disease, and nutritious food is the main source of the proper growth of the body. Good nutrition is a basic component of health. National Programme for Nutritional Support to Primary Education (NP-NSPE) is considered as a goal to achieve the objective of providing free and compulsory primary education of the children age of 6-14 years. This scheme also giving a boost to the universalization of primary education through increased enrolment, improved school attendance, and retention and promoting the nutritional status of primary school children⁶. The present study was carried out to find out the nutritional status of children receiving Mid-Day Meal in schools of Varanasi.

Aims and Objectives

1. To study the nutritional status of children receiving mid-day meal in schools of Varanasi.
2. To compare nutritional status of school going age children of Varanasi with the WHO standard.

Materials and Method

To assess the impact of mid-day meal program on nutrition, the data was collected from five government primary schools from two different educational blocks

in Varanasi. Out of ten educational blocks of Varanasi one from each rural and urban blocks were selected as for sampling. Nagar Nigam block and Kashi Vidyapeeth block was selected from urban and rural area of Varanasi respectively. 160 students are girls and 160 students are boys selected through the simple random sampling. In every school, two students were selected form each classes from primary and upper primary schools (Class 1-8) from selected blocks of Varanasi. The development of an international growth standard for monitoring of school-aged children is driven by 2 contemporary events, the global rise in childhood obesity and the release of a new international development standard for preschool children by WHO⁷. Physical examination of all children was carried out and their height in cm and weight in kg were recorded. Each child's height and weight were measured in the metric system, using standardized techniques⁸. To assess the height of the children a stadiometer (measuring rod) was used which was capable of measuring to an accuracy of 0.1 cm. To record the weight of the children portable balance was used with an accuracy of 100 g. Children were instructed to stand on the balance with light clothing and without footwear and with feet apart and looking straight. The mean height and weight of the children according to age and sex were compared with the mean height and weight for age as per the World Health Organisation standards⁹.

The Nutritional status of the studied children was assessed using Waterlow (1973) criteria¹⁰. Table 1 shows, the Waterlow criteria assume that the expected height and weight measurements of the child follow the fiftieth centile of the growth curves. This assumption is necessary because prior height or weight measurements may not be available¹¹.

Table 1: Waterlow classification of Malnutrition

	Normal	Mild	Moderate	Severe
Height for Age (%)	95	90-95	85-90	85
Weight for Age (%)	90	80-90	70-80	70

Decreased height for age suggests chronic malnutrition (stunting); Decreased weight for age suggests acute malnutrition (wasting). Adapted from Waterlow (1973).

Acute malnutrition (i.e., wasting) measured in terms of weight deficit by Waterlow criteria can be determined by the following equation:

$$\text{Weight deficit (\%)} = (\text{Actual weight (kg)} / \text{Expected weight (kg) for actual height}) \times 100$$

Chronic malnutrition (i.e., stunting) measured in terms of height or length deficit by the Waterlow criteria can be determined by the following equation:

$$\text{Height deficit (\%)} = (\text{Actual height (cm)} / \text{Expected height (cm) at 50th centile for chronological age}) \times 100$$

Data Analysis and Results

The data were checked for completeness, coded and entered into MS Excel and analyzed using SPSS version 21.0. The data were analyzed using descriptive statistics consisting of measures of percentage, frequencies, and central tendency. Table 2 shows the distribution of students according to the age and sex. Maximum number of boys is 33 (20.6 %) and girls is 36 (22.5%) were in the age group of 12.

Table 2: distribution of students according to age and gender

Age (in years)	Boys		Girls		Total	
	No.	%	No.	%	No.	%
6	17	10.62	11	6.87	28	8.75
7	15	9.37	20	12.50	35	10.93
8	15	9.37	22	13.75	37	11.56
9	12	7.5	23	14.37	35	10.93
10	18	11.25	17	10.62	35	10.93
11	31	19.37	16	10.00	47	14.68
12	33	20.62	36	22.50	69	21.56
13	13	8.12	10	6.25	23	7.18
14	6	3.75	5	3.12	11	3.43
Total	160	100.00	160	100.00	320	100.0

Source: Authors Calculation

Table 3 indicated that the distribution of height of boys was shorter than boys of WHO standards in age 7, 9, 12, 13 and 14 by -1.8 cm to -6.4 cm. The height and weight of boys increased within the age from 6 to 14 years. The maximum difference was found in the age group of 13 years. In case of weight, age group of 6, 7, 11, 12, 13 and 14 were found lower weight to compare the WHO standard in boys. The maximum difference was found in the age group of 13 years.

Table 3: Comparison of mean height for MDM boy's with WHO standards on the basis of age.

Boys (n= 160)							
Age (in years)	No. of Students	Height (WHO)	Mean Height (in cm)	Difference value (\pm)	Weight (WHO)	Mean Weight (in kg)	Difference value (\pm)
6	17	116.0	118.2	2.2	20.5	19.5	-5.0
7	15	121.7	119.9	-1.8	22.9	21.7	-1.2
8	15	127.3	128.1	1.2	25.4	25.9	0.5
9	12	132.6	129.2	-3.4	28.1	28.8	0.7
10	18	137.8	139.9	2.1	31.2	35.4	4.2
11	31	143.1	145.6	2.5	36.9	33.9	-3.0
12	33	149.1	145.8	-3.3	40.3	36.3	-4.0
13	13	156.0	149.6	-6.4	46.7	38.8	-7.9
14	6	163.2	158.1	-5.1	52.9	50.4	-2.5

Source: Authors calculation

Table 4 indicated that the distribution of height of girls indicated that girls were found shorter than girls of WHO standards¹² by 3.1 cm to 8.1 across the age group of 6, 9, 10, 11, 12, 13 and 14. The maximum difference was found in the age group of 6 years. Table 4 also indicated that the weight of girls increased within the age from 6 to 14 years except in 11 years. The weight in the age group 6 to 14 years ranged from 17.9 kg to 52.1 kg in girls. In girls, the weight was found lower than the WHO standard across age group in 6, 7, 11, 12, 13 and 14 years.

Table 4: Comparison of mean height for MDM girl's with WHO standards on the basis of age.

Girls (n=160)							
Age (in years)	No. of Students	Height (WHO)	Mean Height (in cm)	Difference value (\pm)	Weight (WHO)	Mean Weight (in kg)	Difference value (\pm)
6	11	115.1	107.0	-8.1	20.2	17.9	-2.3
7	20	120.8	126.1	5.3	22.4	21.6	-0.8
8	12	126.6	127.4	0.8	25.0	26.5	1.5
9	23	132.5	129.6	-3.1	28.2	29.8	1.6
10	17	138.6	134.4	-4.2	31.9	34.6	2.7
11	16	145.0	141.3	-3.7	35.7	32.4	-3.3
12	36	151.2	147.8	-3.4	41.9	37.8	-4.1
13	10	156.4	152.7	-3.7	46.4	41.8	-4.6
14	5	159.8	153.7	-6.1	50.7	52.1	1.4

Source: Authors Calculation

Table 5 shows 45 per cent of children were found to be normal as per their weight for age. From table 5 also to be found that 55 per cent were malnourished and

6.2 per cent were in a severe degree of wasting. About more than half (55%) of them are suffered from wasting whereas, 26.9 per cent and 21.9 per cent were in a mild and moderate degree of malnutrition respectively.

Table 5: Nutritional status (Wasted) of children as per gender

Gender	No.	Normal	Wasted		
			Mild	Moderate	Severe
Boys	160	74 (46.3)	41 (25.6)	36 (22.5)	9 (5.6)
Girls	160	70 (43.7)	45 (28.2)	34 (21.2)	11 (6.9)
Total	320	144 (45.0)	86 (26.9)	70 (21.9)	20 (6.2)

Figures in parenthesis indicate percentages

Table 6 shows 72.8 per cent of children were found to be normal as per their height for age. From table 6 also to be found that 20.3 per cent children were in a mild degree of stunting and 5 per cent were in a moderate degree of stunting while a very less (1.9%) children were in a severe degree of stunting.

Table 6: Nutritional status (Stunted) of children as per gender

Gender	No.	Normal	Wasted		
			Mild	Moderate	Severe
Boys	160	119 (74.4)	31 (19.4)	9 (5.6)	1 (0.6)
Girls	160	114 (71.3)	34 (21.2)	7 (4.4)	5 (3.1)
Total	320	233 (72.8)	65 (20.3)	16 (5.0)	6 (1.9)

Figures in parenthesis indicate percentages

Discussion

The study undertaken on a representative and adequate sample of Varanasi revealed that as per Waterlow classification, around 45 per cent of children were found to be normal as per their weight for age and 72.8 per cent of children were found to be normal as per their height for age. The prevalence of wasting and stunting in these children was high (55 % wasted and 27 % of stunted), with boys and girl suffering almost equally. The observations of the present study suggest

that the distribution of height of boys were found shorter than boys of WHO standards by -1.8 cm to -6.4 across all ages. The maximum difference was found in age group of 13 years. The weight of boys increased with in age from 6 to 14 years. The weight in the age group 6 to 14 years ranged from 19.5 kg to 50.4 kg in boys. In case of weight, age group of 6, 7, 11, 12, 13 and 14 were found lower weight to compare the WHO standard in boys. The maximum difference was found in the age group of 13 years. Distribution of height of girls

indicated that the girls were found shorter than girls of WHO standards by -8.1 cm to 5.3 cm across all ages. The maximum difference was found in age group of 7 years. The weight of girls increased within the age from 6 to 14 years except in 11 years. The weight in the age group 6 to 14 years ranged from 17.9 kg to 52.1 kg in girls. In girls, the weight was found lower than the WHO standard across age group in 6, 7, 11, 12, 13 and 14 years.

Alim et al. reported that the girls of MDM schools were shorter than the ICMR well to do Indian girls at all ages except at age of 6 and 12 years (higher by 1.7cm and 1.6 cm, respectively) the maximum difference was found in age group of 9 years. Results on the height of boys indicated that the MDM boys were found shorter than boys of ICMR standard by 0.1 cm to 8.7 cm across all ages. The maximum difference was found in age group of 12 years. Gangadharan¹³ et al found prevalence of malnutrition up to 34.20 per cent in Kerala school children. Goyal¹⁴ et al also reported malnutrition among Ahmednagar school children to be only 20 per cent, with 6.8 per cent having severe malnutrition.

Conclusion

In the present study, it was observed that there was a high degree of relationship between height, weight and age. It can be concluded that boys were taller and heavier than girls. Statistically, the mean weight of boys and girls was found shorter than boys and girls of WHO standards. There was no significant difference in the prevalence of stunting and wasting for both boys and girls.

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Dance – As A Source of Relieving Stress among Women

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Abstract

Stress is a natural feeling that people have when they are overloaded with burdens and struggling a lot to cope up with demands. The demands may be related to financial constraints, work related issues, relationships, and other situations, which may be challenging or threat, full for a person's existence. Stress is also called as a motivator. It will act as a fight-to-fight mechanism, which will helps how to fight against danger for survival. However, when there are too many stressors at one time may affect the person's mental and physical health and is very dangerous to the person. The present study focuses to analyze the impact of dance on stress among women with respect to Kerala.

Key Words: *Stress, Dance, Mental Health, Physical Health*

Introduction

Stress is the body's natural defense system against risks. It activates the body with hormones and prepare the systems to evade danger¹. This process is called fight-to-fight mechanism. Thus, the body produces large quantities of chemical cortisol, adrenaline and noradrenaline². These trigger will increase heart rate, muscle problems, sweating, and alertness. The more stressors we have the more stressful the person will be. Short-term stress can be helpful but long-term stress will lead to various health issues and problems³. Excess stress leads to increased blood pressure and pulse rate, breathing will be faster, digestive system slows down very quickly, body muscles will become tense, reduces sound sleep. All these symptoms are dangerous to health and will definitely affect normal body functions. Stress can make an individual productive and constructive when it is identified and well managed.⁴Adaptation towards a new situation from the old will reduce the stress to some extent.

Human beings react towards stress differently. What is stress in one person may not be the stress in another person. Therefore, anything can cause stress. Men and women have many of the sources of stress in common⁵. Possibly a little more stress is found in women since they play many roles in life. Women's role includes family obligations, taking care of children

and elderly people, work responsibilities and as well as other roles. Often they will spend more time meeting the needs of others rather than nurturing their own needs. Since they are working at high stress levels, are not able to recognize their needs even. This study aims to understand how women's of Kerala are managing their stress and whether dance and yoga has any impact on managing the stress.

Results of the studies continue to support a growing literature suggesting that exercise, physical activity and physical-activity interventions have beneficial effects across several physical and mental-health outcomes. Generally, participants engaging in regular physical activity display more desirable health outcomes across a variety of physical conditions. Physical-activity interventions show better health outcomes, including better general and health-related quality of life, better functional capacity and better mood state⁶.

Stress is a part of day-to-day living. In our daily lives, we are often exposed to situations that produce stress. The interpretation and reaction to events that make stress are different for different people⁷

Improving the individual's evaluations and coping skills, and the provided practices to integrate the learned separations with real life situations could lead to a decrease in the perceived stress and an increase in the psychological well-being.⁸

Objectives:

1. To analyze the common major life events that trigger stress.
2. To analyze the physical symptoms of stress.
3. To analyze the emotional reactions of stress.
4. To analyze the behavior's linked to stress.

5. To study whether Dance have any impact for reducing stress.

Materials and Methods

The study is purely descriptive in nature. Both primary and secondary data is used for the study. Primary data were collected from a sample of 49 women engaged in dance and yoga from Ernakulum district.

Table No. 1: Symptoms of Stress

Physical Symptoms of Stress	Sweating	Pain in the back	Cramps	Fainting	Headache	Heart Disease	High blood Pressure	Lower Immunity	Muscular aches	Nervous twitches	Pins and needles	Sleeping difficulties	Stomach upset	Menstrual problems
N	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Mean	.4898	.3265	.2449	.0816	.9184	0.0000	.5102	.1633	.2245	.3265	.0816	.6735	.2857	.3265
Common Major Life Stress	Job issues	Lack of time	Sadness	Family Problems	Illness	Moving Home	Relationships							
Mean	.5510	.2857	.2653	.4898	.3673	0.0000	.3673							
Median	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							
Mode	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

Source: Primary Data

The table explains the major common life events that trigger stress in women. Majority of stress are due to the Job issues relating to work environment. It comes to nearly 55.1 percent. 49 percent of stress issues are due to family problems. Because of relationships with respect to marriage issues and divorce comes to nearly 36 percent of stress. So number of factors are leading towards stress

for women.

The table explains that the major physical symptoms for stress among women is headache, which comes to nearly 91.8 percent. Nearly 67 percent of women are struggling with sleeping difficulties because of stress.

Other factors like high blood pressure, sweating, pain in the back and mensural problems are other physical symptoms which leads towards stress.

Table No: 2:Reactions because of Stress

Emotional Reactions because of Stress	Anger	Anxiety	Burnout	Concentration issue	Depression	Fatigue	Insecurity	Forgetfulness	Irritability	Nail Biting	Restlessness	Sadness
N	49	49	49	49	49	49	49	49	49	49	49	49
Mean	.7551	.5102	.0408	.4898	.6122	.3469	.2041	.2653	.5918	.2041	.4898	.4898
Behaviors Linked to Stress	Food Carving	Sudden Anger	Drug & Alcohol	Higher Tobacco	Social Withdrawal	Frequency Crying	Relationship Problems					
N	49	49	49	49	49	49	49					
Mean	.4898	.8163	.0816	0.0000	.4286	.3469	.4694					

Source: Primary Data

The table clearly states that nearly 75.5 percent of women emotionally react their stress through anger. Because of high stress, women are leading towards depression, which comes near to 61.2 percent. The study also shows that high level of irritability, anxiety, concentration issue and restlessness are also affecting women very badly because of stress.

The table explains that sudden anger because of stress is one of the major behavioral impact because of stress among women. It constitute nearly 81.6 percent. Other factors like food carving, relationship issues are also another behavioral symptoms of more stress.

Majority of the sample chosen belonged to the age group of 30-40, which covers nearly 44.9 percent. 40.8 percent were from the age group of 20-30. Only 14.3 percent were from 40 -50 age group. The study explains that majority of the respondents chosen for the study were non-working women which is around 61.2 percent. There were 20.4 percent teachers and only 9 percent doctors in the study.

Chi-Square Tests was applied to achieve the following hypothesis.

Ho 1: There is an association between Dance and Physical Health Benefits

Table No. 3: Chi-Square Tests - Pearson Chi-Square

Physical Health Benefits	Value	df	Asymp. Sig. (2-sided)*
Is a full body workout	.628	2	.730
Gives a flat stomach	.652	2	.722
Dancing makes you smarter	3.975	3	.264
Reduce stress hormones	3.755	3	.289
Stronger bones	2.075	2	.354
Increase Muscular Strength	.604	1	.437
Improve condition of Lungs	2.391	3	.495

* 5% level of significance

Table No. 4: Correlation

Correlations									
		Dance	Improve condition of lungs	Increase muscular strength	Stronger bones	Reduce stress hormones	Dance makes you smarter	Gives flat stomach	Is a full body workout
Dance	Pearson Correlation	1	-.188	-.111	.091	.172	.087	-.109	-.108
	Sig. (2-tailed)		.196	.448	.536	.236	.553	.454	.459
Improve condition of lungs	Pearson Correlation	-.188	1	.634**	.329*	.270	.378**	.601**	.403**
	Sig. (2-tailed)	.196		.000	.021	.061	.007	.000	.004
Increase muscular strength	Pearson Correlation	-.111	.634**	1	-.052	-.054	-.085	.195	-.008
	Sig. (2-tailed)	.448	.000		.724	.713	.561	.179	.959

Table No. 4: Correlation

Stronger bones	Pearson Correlation	.091	.329*	-.052	1	.577**	.729**	.724**	.502**
	Sig. (2-tailed)	.536	.021	.724		.000	.000	.000	.000
Reduce stress hormones	Pearson Correlation	.172	.270	-.054	.577**	1	.386**	.357*	.415**
	Sig. (2-tailed)	.236	.061	.713	.000		.006	.012	.003
Dance makes you smarter	Pearson Correlation	.087	.378**	-.085	.729**	.386**	1	.680**	.683**
	Sig. (2-tailed)	.553	.007	.561	.000	.006		.000	.000
Gives flat stomach	Pearson Correlation	-.109	.601**	.195	.724**	.357*	.680**	1	.762**
	Sig. (2-tailed)	.454	.000	.179	.000	.012	.000		.000
Is a full body workout	Pearson Correlation	-.108	.403**	-.008	.502**	.415**	.683**	.762**	1
	Sig. (2-tailed)	.459	.004	.959	.000	.003	.000	.000	
	N	49	49	49	49	49	49	49	49
** . Correlation is significant at the 0.01 level (2-tailed).									
* . Correlation is significant at the 0.05 level (2-tailed).									

The table shows that the Chi square value, $P > .05$ shows an association at the respective degree of freedom. The test result shows an association exist between Dance and Physical health benefits. The correlation is undertake between the variables. It was hypothesized that a relationship exists between Dance and Physical health benefits. The results above states that , there exists a positive relationship between Dance and Physical health benefits with respect to various variables like

Improve condition of lungs, Increase muscular strength, Stronger bones, Reduce stress hormones, Dance makes you smarter, Gives flat stomach, Is a full body workout.

Chi-Square Tests was applied to achieve the following hypothesis.

Ho 2: There is an association between Dance and Mental Health Benefits

Table No. 5: Chi-Square Tests - Pearson Chi-Square

Mental Health Benefits	Value	df	Asymp. Sig. (2-sided)*
Pearson Chi-Square -Creates social bonding	2.463 ^a	3	.482
Pearson Chi-Square - Good activity for any age	.604 ^a	1	.437
Pearson Chi-Square - Make you feel better	3.051 ^a	2	.218
Pearson Chi-Square - Great stress reliever	4.363 ^a	2	.113
Pearson Chi-Square - Is a good cardio workout	2.444 ^a	3	.485
Pearson Chi-Square - Reduces depression	3.213 ^a	2	.201
Pearson Chi-Square - Sense of satisfaction	4.049 ^a	2	.132

* 5% level of significance

Table No. 6: Correlations

		Dance	Sense of satisfaction	Reduces depression	Is a good cardio workout	Great stress reliever	Make you feel better	Good activity for any age	Creates social bonding
Dance	Pearson Correlation	1	.272	.161	.141	.219	.173	.111	.190
	Sig. (2-tailed)		.058	.268	.332	.131	.235	.448	.192
Sense of satisfaction	Pearson Correlation	.272	1	.528**	.168	.478**	.373**	.660**	.405**
	Sig. (2-tailed)	.058		.000	.248	.001	.008	.000	.004

Cont... Table No. 6: Correlations

Reduces depression	Pearson Correlation	.161	.528**	1	.832**	.804**	.667**	.340*	.722**
	Sig. (2-tailed)	.268	.000		.000	.000	.000	.017	.000
Is a good cardio workout	Pearson Correlation	.141	.168	.832**	1	.752**	.633**	.263	.780**
	Sig. (2-tailed)	.332	.248	.000		.000	.000	.068	.000
Great stress reliever	Pearson Correlation	.219	.478**	.804**	.752**	1	.829**	.308*	.566**
	Sig. (2-tailed)	.131	.001	.000	.000		.000	.031	.000
Make you feel better	Pearson Correlation	.173	.373**	.667**	.633**	.829**	1	.328*	.686**
	Sig. (2-tailed)	.235	.008	.000	.000	.000		.021	.000
Good activity for any age	Pearson Correlation	.111	.660**	.340*	.263	.308*	.328*	1	.463**
	Sig. (2-tailed)	.448	.000	.017	.068	.031	.021		.001
Creates social bonding	Pearson Correlation	.190	.405**	.722**	.780**	.566**	.686**	.463**	1
	Sig. (2-tailed)	.192	.004	.000	.000	.000	.000	.001	
** . Correlation is significant at the 0.01 level (2-tailed).									
* . Correlation is significant at the 0.05 level (2-tailed).									

The table shows that the Chi square value, $P > .05$ shows an association at the respective degree of freedom. Thus, there exist an association between Dance and Mental health benefits. Dance deals to better health benefits of women. The correlation is undertaken between the variables. It was hypothesized that a relationship exists between Dance and Mental health benefits. The results above states that , there exists a positive relationship between Dance and Mental health

benefits with respect to various variables like Sense of satisfaction, Reduces depression, Is a good cardio workout, Great stress reliever, Make you feel better, Good activity for any age, Creates social bonding.

Findings and Discussion

Majority of the sample chosen belonged to the age group of 30-40, which covers nearly 44.9 percent.

40.8 percent were from the age group of 20-30. Only 14.3 percent were from 40 -50 age group.

- Majority of the respondents were non-working women, which is around 61.2 percent. There were 20.4 percent teachers and only 9 percent doctors in the study.

- Majority of stress are due to the Job issues relating to work environment. It comes to nearly 55.1 percent. 49 percent of stress issues are due to family problems.

- The major physical symptoms for stress among women is headache, which comes to nearly 91.8 percent. Nearly 67 percent of women are struggling with sleeping difficulties because of stress. Other factors like high blood pressure, sweating, pain in the back and mensural problems are other physical symptoms, which leads towards stress.

- Nearly 75.5 percent of women emotionally react their stress through anger. Because of high stress, women are leading towards depression, which comes near to 61.2 percent.

- Sudden anger because of stress is one of the major behavioral impact because of stress among women. It constitute nearly 81.6 percent. Other factors like food carving, relationship issues are also other behavioral symptoms of more stress.

- There exists a positive relationship between Dance and Mental health benefits with respect to various variables like Sense of satisfaction, Reduces depression, Is a good cardio workout, Great stress reliever, Make you feel better, Good activity for any age, Creates social bonding.

- There exists a positive relationship between Dance and Physical health benefits with respect to various variables like Improve condition of lungs, Increase muscular strength, stronger bones, Reduce stress hormones, Dance makes you smarter, Gives flat stomach, is a full body workout.

- The Chi square proved that there is an association between Dance, Physical, and Mental Health Benefits with respect to women.

Discussion and Conclusion

Thus as a conclusion to the study it can be revealed that stress is a common issue in every human being, but the increased level of stress leads to various unexpected health problems. However, dance as a good physical exercise will helps to reduce stress to a good level among women. It benefits both mental and physical condition among women. Dance will act as a source of athletes. It helps to reduce anxiety. It provides emotional benefits, improves memory, makes smarter, it is good for brain, muscles and bones. It makes the body healthier. It will definitely reduce stress. Thus it is suggested to all women's irrespective of working or non-working to get involved in dance as part of their life which can be practiced at any age to make prepare them mentally and physically stronger.

Conflict of Interest – NIL

Source of Funding- Self

Ethical Clearance – NA

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Pulse Oximetry in Comparison to Arterial Blood Oxygen Saturation in Patients with Respiratory Distress in Neonatal Intensive Care Unit (NICU)

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Abstract

Background: It is essential to monitor the saturation of oxygen in newborns receiving supplemental oxygen to reduce the incidence of exposure to hyperoxemia and their potential hazardous effects of radical oxygen species. The oxygen saturation is measured by pulse oximeter which is a non-invasive tool. Arterial blood gas is used to determine the pH, PaCO₂, PaO₂ and the bicarbonate level.

Aims and Objectives: This study aimed at searching the reliability of non-invasive pulse oximeter in knowing oxygen saturation (SpO₂) in comparison with arterial blood PaO₂ in neonates with respiratory distress.

The primary objective was to correlate the values between partial pressure of oxygen (PaO₂) and pulse oxygen saturation by pulse oximeter (SpO₂). The secondary objectives were 1) To find out the efficacy of pulse oximeter in diagnosing hypoxia in comparison with PaO₂.

2) To find out efficacy of pulse oximeter in diagnosing hyperoxemia in comparison with PaO₂.

Material and Method: Observational study was conducted on thirty neonates suffering from different causes of respiratory distress in NICU of Krishna Hospital, Karad during December 2017 to September 2019.

The PaO₂ measurements were obtained from the blood analyzer; simultaneous pulse oxygen saturation were recorded.

Results: A significant correlation was observed between values of pulse oxygen saturation by pulse oximeter (SpO₂) and partial pressure of oxygen (PaO₂) by arterial blood sampling (r value -0.73, p<0.01)

On ROC curve analysis, sensitivity and specificity of pulse oximetry in prediction of hypoxemia was 87.5% and 85.7% at cut-off of 90% and 91% each. The sensitivity and specificity of pulse oximetry in prediction of hyperoxemia was 100% and 71.4% at cut-off of 94% while it was 88.9% and 76.2% at cut-off of 95% respectively.

Conclusion: Pulse oximetry showed a good correlation with arterial blood PaO₂. Oxygen saturation measured by pulse oximetry is a good diagnostic and prognostic tool for detecting hypoxemia and hyperoxemia.

Keywords: Pulse oximetry, Arterial blood gas, Oxygen Saturation, Partial Pressure of Oxygen, Hypoxemia, Hyperoxemia.

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Introduction

The most prevalent cause for a neonate to get admitted in NICU is Respiratory Distress. 30% of late preterm neonates and 14% of term neonates admitted in

NICU develop respiratory morbidity which is due to a significant cause. This morbidity is more in neonates born before gestational age of 34 weeks. In resting neonates if the Respiratory Rate is more than 60 per minute and if there are inspiratory costal retractions or expiratory grunting is present then it is considered as Respiratory distress. The neonate should be diagnosed after seeing in the first few minutes and lifesaving measure should be considered immediately and further plan of management should be drawn.¹

In neonates the common etiologies of Respiratory distress are: Respiratory distress syndrome(RDS), Transient Tachypnea of Newborn (TTN), Meconium Aspiration Syndrome(MAS), Persistent Pulmonary Hypertension of the newborn (PPHN), Congenital pneumonia or Acquired pneumonia, Congenital anomalies of upper airway, hematological Causes(severe anemia, polycythemia), Congenital Heart Disease(CHD), Metabolic disorders- Inborn Errors of Metabolism(IEM), Neurological causes like Seizures.¹

It is essential to monitor the saturation of oxygen in newborns receiving supplemental oxygen in order to reduce the incidence of exposure to hyperoxemia and the Risk of potential hazardous effects of radical oxygen species.²

The adequacy of oxygenation and ventilation are assessed by the Arterial blood gas analysis which is the gold standard.³ Indirectly the oxygen saturation of a patient's blood is measured by pulse oximeter which is a non-invasive tool.⁴ It is necessary to determine whether the non-invasive pulse oximetry which is easy to use and can be used continuously to monitor saturation of the patient with no side effects is preferred for monitoring oxygen in comparison to invasive method of arterial blood gas analysis which might lead to anemia because of repeated sampling and which also requires heparin in order to prevent coagulation of blood.⁵

This study aims to correlate between PaO₂ and SpO₂ values during routine practice and whether pulse oximeter can replace arterial blood gas.

Methodology

This study was carried out in NICU of Krishna Institute of Medical Science, Karad from December

2017 to September 2019. Thirty neonates who were suffering from different causes of respiratory distress in Neonatal Intensive Care Unit (NICU) were enrolled.

Inclusion Criteria:

1. Both Genders
2. Gestational age: Preterm and Term
3. Neonates having DOWNE score of more than or equal to 4

Exclusion Criteria:

1. Major congenital anomalies and acute clinical changes or changes in SpO₂ of more than 1% during arterial sampling, jaundiced as all these factors affect Saturation of Peripheral Oxygen (SpO₂) reading.

2. Congenial Heart Disease and Shock

Analysis of blood gases using arterial samples.

The saturation of Peripheral Oxygen (SPO₂) monitor, reading was observed and recorded

Saturation of Peripheral Oxygen (SPO₂) readings have to remain stable for 60 seconds before and 60 seconds after the blood gas sampling with an accepted maximal variation of Saturation of Peripheral Oxygen (SPO₂) of no more than 1%

Statistical Analysis

Mean \pm SD was applied for quantitative data. Categorical and nominal data was expressed in percentage. Quantitative variables were correlated using Pearson's correlation coefficient. To find the association between pulse oximetry and arterial oxygen saturation linear regression analysis were applied. ROC curve analysis was used to find the efficacy of pulse oximetry and optimal cut-offs for hypoxemia and hyperoxemia. The significance threshold of p-value was set at <0.05. All analysis was carried out by using SPSS software version 21.

Results

Out of the total 30 neonates with respiratory distress, 76.7% were males and 23.3% were females

Mean gestation age of the study cases was 36.3

weeks with half of them delivered after 37 weeks or more.

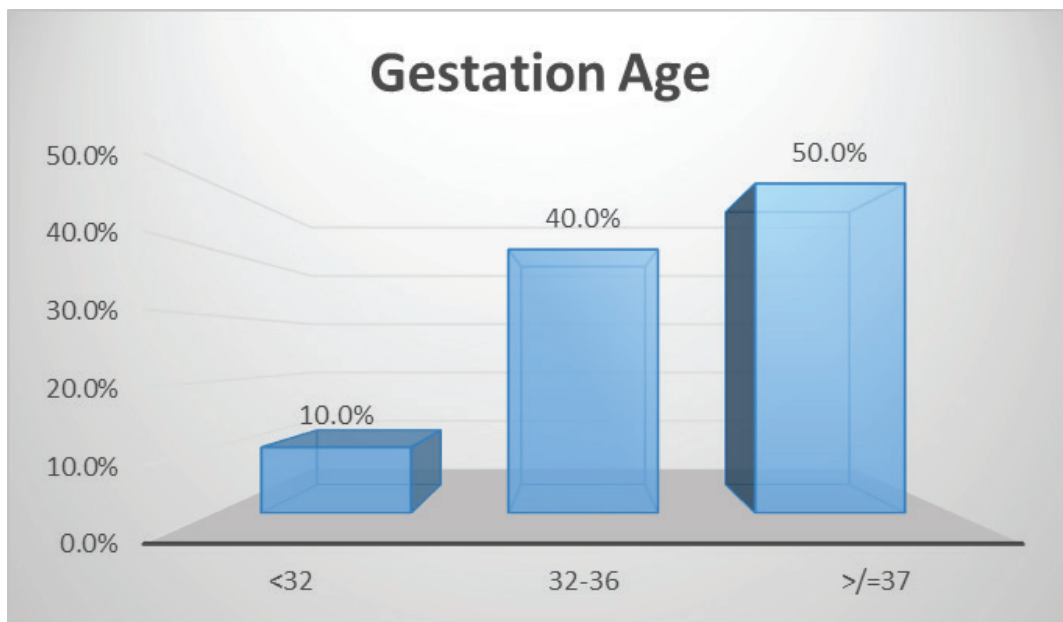


Figure 1: Distribution of study cases as per Gestational Age

Mean birth weight of the neonates was 2.1 Kg with 56.7% cases had low/ very low/ extremely low birth weight.

Most common etiology for respiratory distress among neonates was Meconium Aspiration Syndrome (33.3%), followed by Hyaline Membrane Disease (23.3%), congenital pneumonia (16.7%) and TTN (13.3%).

A significant correlation was observed between values of SpO2 and PaO2 by arterial blood sampling (r- value – 0.73, p<0.01).

Pearson co-relation		
Table 1 : Distribution of study cases as per Correlation between SpO2 & Arterial blood gas analysis		
ABG PARAMETERS	r-value	p- value
SpO2 and PaO2	0.73	<0.01

On Regression analysis, a significant association was observed between pulse oxygen saturation by pulse oximeter (SPO₂) and partial pressure of oxygen (PaO₂)

Regression Equation : PaO₂ = 4.89 (SpO₂) -336.616

On ROC curve analysis, sensitivity and specificity of pulse oximetry in prediction of hypoxemia was 87.5% and 85.7% at cut-off of 90% and 91% each.

Hypoxemia (<cut-off)	Sensitivity	Specificity
90%	87.5%	85.7%
91%	87.5%	85.7%
92%	81.3%	85.7%

Table 2: Screening efficacy of pulse oximetry for detection of Hypoxemia

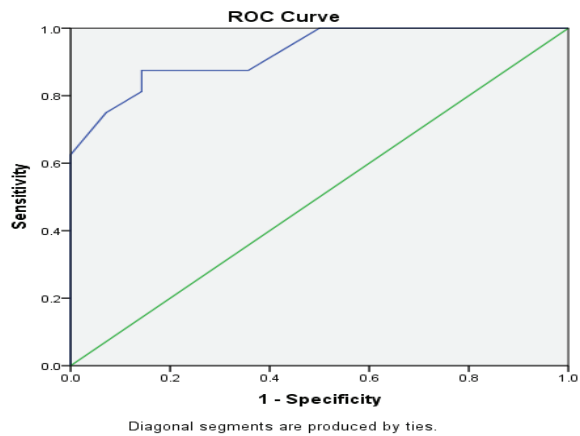


Figure 2: Screening efficacy of pulse oximetry for detection of Hypoxemia

On ROC curve analysis, sensitivity and specificity of pulse oximetry in prediction of hyperoxemia was 100% and 71.4% at cut-off of 94% while it was 88.9% and 76.2% at cut-off of 95% respectively.

Hyperoxemia (>cut-off)	Sensitivity	Specificity
94%	100.0%	71.4%
95%	88.9%	76.2%
96%	77.8%	90.5%

Table 3: Screening efficacy of pulse oximetry for detection of Hyperoxemia

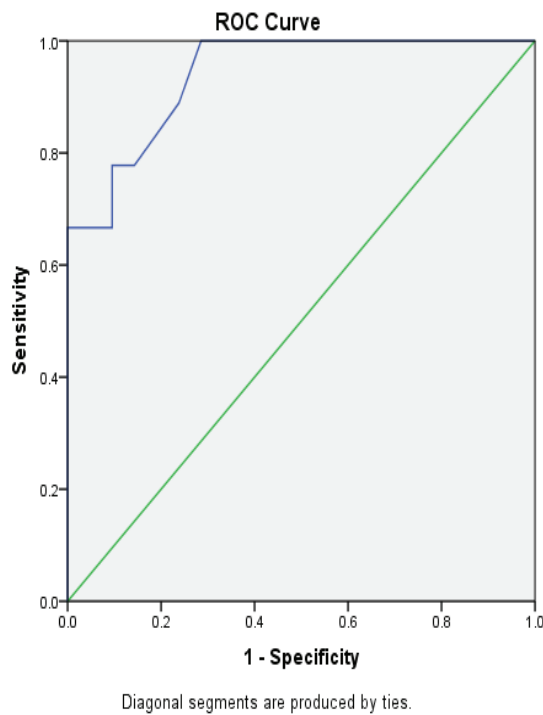


Figure 3. Screening efficacy of pulse oximetry for detection of Hyperoxemia

Discussion

Respiratory distress in neonatal period is an emergency. Hypoxemia, hypercarbia and acidosis will result from prolonged distress. These changes will cause constriction of pulmonary vasculature and multi system organ dysfunction will occur if fetal circulation remains persistent and there is shunting of blood from right to left side.⁶

It is essential to monitor the saturation of oxygen in newborns receiving supplemental oxygen in order to reduce the incidence of exposure to hyperoxemia and the risk of potential hazardous effects of radical oxygen species.⁷

The fifth vital sign for assessing every newborn is the Pulse oximeter oxygen saturation (SpO₂).⁸ Normally the saturation of oxygen is 93% in healthy newborns in room air and differs according to post-natal age.⁹

The adequacy of oxygenation and ventilation are assessed by the Arterial blood gas analysis which is the gold standard.

Indirectly the oxygen saturation of a patient's blood is measured by pulse oximeter which is a non-invasive tool. Though various studies showed the validity of pulse oximetry as a replacement for ABG, more data is needed for its accuracy. The aim of the present study was to assess pulse oxygen saturation and PaO₂ values and to determine whether PaO₂ levels are related to pulse oxygen saturation values and can it replace the former. Study included 30 neonates suffering from respiratory distress due to various etiologies in neonatal intensive care unit (NICU).

Out of the total 30 neonates with respiratory distress, 76.7% were males and 23.3% were females. Mean gestation age of the study cases was 36.3 weeks with half of them delivered after 37 weeks or more. Mean birth weight of the neonates was 2.1 Kg with 56.7% cases had low/ very low/ extremely low birth weight. Doss WS et al.¹⁰ in their study observed 41 out of 50 neonates being boys (91.9%). The mean gestational age among babies was 35 ± 3.6 weeks and the mean birth weight was 2.3± 0.8 kg. Niknafs P et al.¹¹ in their study 30 preterm infants were observed, male were 16 (53.3%) and female were 14 (46.7%). 31 weeks was the mean gestational age, with while 1340 grams was the mean

birth weight, range being 900 grams to 1500 gram.

Most common etiology for respiratory distress among neonates was Meconium Aspiration Syndrome (33.3%) followed by Hyaline Membrane Disease (23.3%), Congenital Pneumonia (16.7%) and TTN (13.3%).

Doss WS et al.¹⁰ in their study observed most common etiologies as HMD (53.7%), TTN (28.7%) and pneumonia (3.75%). Ritonga SM et al.¹² observed the common etiologies for respiratory distress as Pneumonia (24.2%). In present study HMD was the second etiology to cause respiratory distress while MAS was the primary etiology to cause respiratory distress.

In present study, a significant correlation was observed between values of pulse oxygen saturation by pulse oximeter (SpO₂) and partial pressure of oxygen (PaO₂) by arterial blood sampling (r- value – 0.73, p<0.01). On regression analysis, a significant association was observed between pulse oxygen saturation by pulse oximeter (SpO₂) and partial pressure of oxygen (PaO₂) (p<0.01). PaO₂ = 4.89 (SpO₂) -336.616 was the linear regression equation to predict PaO₂ based on SpO₂ values

Yanda S et al.¹³ observed significant positive correlations between pulse oximeter (SpO₂) and PaO₂ (r-0.403; p<0.05). PaO₂ = 1.912 (SpO₂) - 79.828 was the linear regression equation to predict PaO₂ based on SpO₂ values

Doss WS et al.¹⁰ in their study concluded that PO₂ and SpO₂ were statistically significant. PO₂ increase resulted in SpO₂ increase (r-0.436; p<0.01).

On ROC curve analysis, sensitivity and specificity of pulse oximetry in prediction of hypoxemia was 87.5% and 85.7% at cut-off of 90% and 91% each. On ROC curve analysis, sensitivity and specificity of pulse oximetry in prediction of hyperoxemia was 100% and 71.4% at cut-off of 94% while it was 88.9% and 76.2% at cut-off of 95% respectively. In the study by Niknafs P et al.¹¹ they concluded that pulse oximeter in the detection of hypoxemia had 75% sensitivity and 99.5% specificity while pulse oximeter in the evaluation of hyperoxemia, had sensitivity of 83% and had 92.4% specificity.

Conclusion

Pulse oximetry showed a good correlation with arterial blood PaO₂ i.e. it shows good validity in detecting hypoxemia and hyperoxemia in neonates.

The study thus concludes that oxygen saturation measured by pulse oximetry is a good diagnostic and prognostic tool for detecting hypoxemia and hyperoxemia and can be used safely for continuous monitoring for hypoxemic patients.

Ethical Clearance- received from Institutional Ethics committee of Krishna Institute of Medical Sciences, Karad

Source of Funding- Self

Conflicts of Interest- Nil

Abbreviations

RDS- Respiratory distress syndrome

TTN- Transient Tachypnea of Newborn

MAS- Meconium Aspiration Syndrome

PPHN- Persistent Pulmonary Hypertension of the newborn

SPO₂- Pulse oximeter Oxygen Saturation

PaO₂- Partial Pressure of Oxygen

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Pre Operative Magnetic Resonance Cholangiopancreatography in Laparoscopic Cholecystectomy with Special Reference to Hepatobiliary Anatomic Variations and Undetected Choledocholithiasis

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Abstract

Background: Cholelithiasis is the most common disease state involving the gallbladder and biliary tree. Approximately 5-15 % patients with gallstones are associated with choledocholithiasis. Hepatobiliary anatomic variations are common and routinely encountered during laparoscopic cholecystectomy. Among all investigations, Magnetic Resonance Cholangiopancreatography (MRCP) showed high accuracy in detecting the choledocholithiasis and hepatobiliary anatomical variations. Role of routine MRCP in patients going for laparoscopic cholecystectomy is controversial.

Method: This study was carried out on 68 patients admitted in Geetanjali Medical College and Hospital, Udaipur, Rajasthan in Department of General Surgery from August 2017 to August 2019 with the confirm diagnosis of cholelithiasis and posted for laparoscopic cholecystectomy. All patients underwent MRCP and collected data was analysed.

Results: Among 68 patients, dilated CBD was diagnosed in 4 and 13 patients by USG and MRCP respectively. CBD stone was not detected by USG in any patient but MRCP detected CBD stone in 6 patients. All 6 patients with CBD stones had age of > 50 years. Normal course with right lateral insertion of cystic duct was the most common variant and was found in 57 patients in MRCP and 62 patients intraoperatively.

Conclusion: MRCP is non-invasive, non-ionizing imaging modality having higher specificity and sensitivity for asymptomatic choledocholithiasis as well as biliary tree anomalies prior to LC. But it is a costly investigation. So its routine use in preoperative evaluation for all patients undergoing for laparoscopic cholecystectomy is advisable in patients having age of > 50 years.

Keywords: Choledocholithiasis, Hepatobiliary anatomic variations, Magnetic resonance cholangiopancreatography, Laparoscopic cholecystectomy.

Introduction

The most common disease state involving the

gallbladder and biliary tree is cholelithiasis. Because the gallbladder concentrates bile, the concentration of solutes in the gallbladder differs from that in the rest of biliary tree. This increase in solute concentration combined with stasis in the gallbladder between meals predispose to stone formation in the gallbladder.¹ First open cholecystectomy was done by Carl Langenbuch in 1882 and it was primary treatment of gallbladder disease through the early 1990s.² After more than 100 years, First laparoscopic cholecystectomy (LC) was done by Erich

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Mühe of Böblingen, Germany.³ In 1992, the National Institutes of Health (NIH) Consensus Development Conference stated that laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gallstones.⁴

Approximately 5-15 % patients with gallstones are associated with choledocholithiasis.⁵ Choledocholithiasis may be asymptomatic or symptomatic with potential complications including post-operative biliary leakage, recurrent biliary colic, cholangitis, and pancreatitis adding further to the burden of management in gallstone disease.⁶ For that reason it is necessary to explore an easy and accurate approach to diagnose the choledocholithiasis preoperatively.

Gallstone disease patients undergo ultrasonography (USG) examination of abdomen and hepatobiliary biochemical serum analyses as part of routine preoperative screening for choledocholithiasis.⁷ Endoscopic retrograde cholangiopancreatography (ERCP) has maximum accuracy in the diagnosis of choledocholithiasis. It is invasive and expensive method and less popular for all patients of gallstones going for laparoscopic cholecystectomy. As well as it is associated with a significant risk of complications like post ERCP pancreatitis, sepsis, bowel perforation, bleeding with 1-7% test related morbidity and a 0.2-1 % mortality rate. Endoscopic ultrasound (EUS) has similar diagnostic accuracy for choledocholithiasis like ERCP but requires special equipment and expertise.⁸

Hepatobiliary anatomic variations are common and routinely encountered during laparoscopic cholecystectomy. Failure to identify some of these clinically important variants may lead to complication during surgery. There is cystic duct variations based on length, course and site of insertion with CHD. Some important variations are low insertion of cystic duct, anterior or posterior spiral course with medial insertion, short cystic duct (length < 5 mm), etc.⁹

MRCP was introduced by Wallner et al in 1991. MRCP is based on the use of heavily T2 weighted fast spin echo sequences. Many literatures showed that sensitivity and specificity of MRCP for diagnosing choledocholithiasis reaches up to 95% and 90% respectively.¹⁰ MRCP is the best noninvasive imaging modality for visualization of hepatobiliary anatomy and

choledocholithiasis. Role of routine MRCP in patients going for laparoscopic cholecystectomy is controversial. So this current study was conducted to check the reliability of preoperative MRCP for hepatobiliary anatomic variations and undetected choledocholithiasis which was not visualized by USG as well as to compare the MRCP findings with intraoperative findings and to evaluate that whether pre-operative MRCP helps in laparoscopic cholecystectomy in anyway.

Materials and method

This was a single-centre prospective observational study conducted in the Department of General Surgery at Geetanjali Medical College and Hospital, Udaipur, Rajasthan from August 2017 to August 2019. A total 68 patients with the confirmed diagnosis of cholelithiasis and posted for laparoscopic cholecystectomy were included. The protocol was approved by institutional ethical committee. Written informed consent was obtained from all participants. The following tests were performed in all the patients: CBC, RBS, BT/CT, B. urea, S. creatinine, S. electrolyte, urine examination, LFT, PT/INR, S. amylase, S. lipase, chest X-ray, abdominal ultrasound, MRCP and ERCP as and when required. Patient diagnosed with CBD stone after investigation were subjected to ERCP stone extraction and then laparoscopic cholecystectomy.

Exclusion Criteria:

- Patients with metallic implant insertion, cardiac pacemakers, metallic foreign body in situ, patients having history of claustrophobia and patients who requires sedation or ventilation.
- Patients with complicated gallstone disease such as acute calculus cholecystitis, empyema of gall bladder, pancreatitis, obstructive jaundice, carcinoma of gallbladder

Results

In our study, the age group of patients ranged from 18-70 years. Out of 68 patients, 16 patients were male and 52 patients were female. Highest incidence of cholelithiasis was found in the age group 18 to 50 years (54.4%). Youngest male was 22 years old and oldest was 70 years old. Youngest female was 19 years old and oldest was 70 years old. Mean age in our study was

48.51±13.31 years. Incidence of cholelithiasis in male and female patients was common in the age group 18 to 50 years and 51 to 70 years respectively. (Table 1)

Wall thickness was found normal in both USG and MRCP in all patients preoperatively. During surgery, wall thickness was found normal in 47 patients (69.1%)

while it was thickened and fibrotic in 19 (27.9%) and 2 (2.9%) patients respectively.

In present study, Dilated CBD was diagnosed in 4 patients (5.9%) by USG and in 13 patients (19.1%) by MRCP. Intraoperatively CBD caliber was found normal in all patients. (Table 2)

Table 1: Distribution of the patients according to Age & Sex

			Age groups		Total
			18 to 50 years	51 to 70 years	
Sex	Male	n	5	11	16
		%	31.25%	68.75%	100.0%
	Female	n	32	20	52
		%	61.5%	38.5%	100.0%
Total		n	37	31	68
		%	54.4%	45.6%	100.0%

Table 2: Distribution of the patients according to caliber of CBD

		Caliber of CBD		Total
		Normal	Dilated	
USG	n	64	4	68
	%	94.1%	5.9%	100.0%
MRCP	n	55	13	68
	%	80.9%	19.1%	100.0%
Intra-operative	n	68	0	68
	%	100.0%	0.0%	100.0%

In our study, CBD stone was not detected by USG in any patient. But MRCP detect CBD stone in 6 patients (8.8%). (Table 3) All 6 patients with CBD stones had age of > 50 years. 4 cases had CBD stone size of < 6 mm and 2 cases had size of > 6 mm. (Table 4)

Table 3: Distribution of the patients according to CBD stone

		CBD stone		Total
		Absent	Present	
USG	n	68	0	68
	%	100.0%	0.0%	100.0%
MRCP	n	62	6	68
	%	91.2%	8.8%	100.0%

Table 4: Distribution of patients according to size of CBD stone in MRCP and age group

		Size of CBD stone		Total
		<6 mm	>6 mm	
Age group	51 to 70 years	4	2	6

Normal course with right lateral insertion of cystic duct was the most common variant and was found in 57 (83.8%) patients in MRCP and 62 (91.2%) patients intraoperatively. Most common variant of cystic duct insertion was low insertion of cystic duct. It was detected by MRCP in 8 (11.8%) patients and intraoperatively in 3 (4.4%) patients. (Table 5)

Table 5: Distribution of the patients according to the cystic duct insertion

		Cystic duct insertion						Total
		Normal course with right lateral insertion	Short cystic duct	Low insertion	Anterior spiral course with medial insertion	Posterior spiral course with medial insertion	Others	
MRCP	n	57	0	8	1	1	1	68
	%	83.8%	0.0%	11.8%	1.5%	1.5%	1.5%	100.0%
Intra-operative	n	62	1	3	0	1	1	68
	%	91.2%	1.5%	4.4%	0.0%	1.5%	1.5%	100.0%

Discussion

Gallstone diseases are one of the commonest surgical problems worldwide. Cholelithiasis is more common in females than in males. In our study, 52 patients were female (76%) and 16 patients were male (24%) (N=68). In this study, the participation of patients with different sex ratio was similar to the previous studies indicating female are more affected by cholelithiasis compared to males. In study by Al-Aubaidi T et al¹¹, 86 patients were female and 14 patients were male (N=100). Virzi V et al¹² found that 75 patients in their study were female out of 104 and rest 29 were male (N=104).

Current study included patients of age 18 to 70 years. The mean age of patients in our study was 48.51 ± 13.31 years. Age of youngest male and female patient in our study was 22 years and 19 years respectively. Age of oldest male and female patients was 70 years. Rao GB et al¹⁰ found that mean age of patients in their study was 54 years. Al-Aubaidi T et al¹¹ also noticed mean age of 46.8 ± 8.1 and 45.9 ± 9.5 in their both group. We found that highest incidences of cholelithiasis were present in age group 18 to 50 years which was 37 patients (54.4%) followed by in age group 51 to 70 years which was 31 patients (45.6%). Al-Aubaidi T et al¹¹ also found that highest number of patient were present in both study groups from age group of 45-55 years and second highest patients were found in age group of 55-65 years and 25-35 years in group 1 and group 2 respectively. We divided patients into two age groups, first 18 to 50 years and second 51 to 70 years. In current study we found that male patients were more common after the age of 50 years as maximum number of male patients were present in age group 51-70 years (11 patients, 68.75%) while female patients were more common in age group 18 to 50 years (32 patients, 61.5%). In study by Rao GB et al¹³, male patients were common in age group 41-70 years (19 patients) while female patients were common in age group 21-40 years (27 patients).

It is also important to know the wall thickness pre operatively because thickened or fibrotic gallbladder wall cause difficulty in surgery. In our study we analysed gallbladder wall preoperatively by USG and MRCP. In all patients wall thickness was found normal by USG and MRCP. During surgery we found normal wall thickness in 47 patients (69.1%) while thickened

gallbladder wall was present in 19 patients who were diagnosed as normal wall thickness preoperatively. Fibrotic gall bladder was found in 2 cases (2.9%). So the pre-operative investigations were not giving exact information about wall thickness in all cases. This concludes that MRCP as a tool to assess difficult laparoscopic cholecystectomy in view of wall thickness of gall bladder is not much helpful. In current study, difference found in wall thickness in USG, MRCP and intraoperative was significant (P value 0.000).

In current study, dilated CBD was detected in 4 cases (5.9%) without stone by USG. MRCP detected choledocholithiasis in 6 patients (8.8%). All these patients with choledocholithiasis were asymptomatic. MRCP showed dilated CBD in 13 patients (19.1%) but out of 13 only 6 patients had CBD stone. All CBD stones were removed by ECRP preoperatively. Rest cases with dilated CBD without stone on MRCP had normal LFT and no jaundice and they were diagnosed as type 1 choledochal cyst by Gastroenterologist, so they were directly posted for laparoscopic cholecystectomy (Table 3). These patients were followed up in postoperative period and none of them reported as retained bile duct stones or biliary leak, etc. This suggests that even if the LFT is normal, there are chances of CBD stones and MRCP is helpful in diagnosis of these cases. Result of our study was statistically significant (P value = 0.012).

Singh S et al¹⁴ observed different sizes of CBD stones in MRCP. They found 7 cases of CBD stone with stone size ≤ 6 mm and 13 cases with stone size > 6 mm. The smallest stone detected by MRCP was 4 mm in diameter. In current study we observed that out of 6 cases of CBD stone detected by MRCP, 4 cases had CBD stone size of < 6 mm and 2 cases had > 6 mm. The smallest stone size was 4 mm. In study by Al-Aubaidi T et al¹¹ they found 2 cases of CBD stone detected by MRCP. Both these patients had age of > 45 years. In our study all 6 cases of CBD stone had age of > 50 years. Youngest patient with CBD stone was 51 years old and oldest patient with CBD stone was 70 years old. We conclude that there are higher chances of CBD stone in and after 5th decade of life. All patients having age of > 50 years must be investigated with MRCP before laparoscopic cholecystectomy because of higher chances of CBD stones in these patients. (Table 4)

In our study, findings of MRCP for cystic duct variations was evaluated during surgery and we found normal course with right lateral insertion in 62 cases (91.2%), short cystic duct in 1 case (1.5%), low insertion cystic duct in 3 cases (4.4%) and posterior spiral course with medial insertion in 1 case (1.5%). On statistical analysis this was found to be non-significant (P value = 0.482). (Table 5)

Table 6: Common cystic duct insertion variations in different studies

		Cystic duct insertion			
		Normal course with right lateral insertion	Short cystic duct	Low insertion	Anterior or posterior spiral course with medial insertion
Our study	n	57	0	8	2
	%	83.8%	0.0%	11.8%	3.0%
Sarawagi R et al15	n	102	2	18	32
	%	51.5%	1.0%	9.0%	16.1%
Ausch C et al16	n	258	0	6	15
	%	90.5%	0.0%	2.1%	5.0%

Conclusion

Our study concludes that MRCP is non-invasive, non-ionizing imaging modality having higher specificity and sensitivity for asymptomatic choledocholithiasis as well as biliary tree anomalies prior to LC. But it is a costly investigation. So its routine use in preoperative evaluation for all patients undergoing laparoscopic cholecystectomy is advisable in patients having age of > 50 years. Except detection of CBD stones, MRCP has no role for preoperative estimation of operative ease in relation to gall bladder status like wall thickness of GB, chronic cholecystitis, etc. in surgery.

Ethical Clearance: Taken from Human Research Ethical Committee

Source of Funding: Self

Conflict of Interest: Nil

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The Size of the Sella Turcica in Skeletal Class I, Class II, and Class III using FACAD Software- South Indian Population Study

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Abstract

Background: The sella turcica is a saddle-shaped bony structure in which anterior wall is formed by tuberculum sellae and posterior wall is formed by dorsum sellae. Lateral cephalometric landmark, sella, is of paramount importance in the field of orthodontics and dentofacial orthopaedics for diagnosis, treatment planning and assessment of skeletal maturation. * Significant literature is available indicating that large variations occur in the shape and size of sella turcica among the three different types of skeletal malocclusion classes.* Studies have been conducted in different regions to evaluate the shape and size of sella turcica in different skeletal malocclusions therefore, the aim of this study is to describe the shape and measure the size of the sella turcica in south Indian subjects with different skeletal types.

Materials and Methodology: Lateral cephalometric radiographs of 60 subjects (30 males and 30 females); 20 Class I, 20 Class II, and 20 Class III. The sella turcica on each lateral cephalometric was analysed using FACAD ortho software tracing to measure the linear dimensions of length, depth, and anteroposterior dimension. One-way analysis of variance was performed to study the relationship between skeletal type and sella size.

Result: Skeletal class III subjects presented with a statistically significant difference in the depth of sella turcica on comparison with skeletal class II ($p > 0.01$). There was statistically insignificant difference found in the anteroposterior dimension and length of sella turcica in skeletal class I, class II and class III.

Conclusion: When the size of sella turcica was compared with skeletal type, a statistically significant difference was found in depth skeletal Class II and Class III subjects.

Keywords: *Sella turcica, lateral cephalometric, skeletal malocclusion, FACAD software.*

Introduction

Sella turcica is also known as pituitary fossa. It is situated in the middle cranial fossa and houses the pituitary gland. ⁽¹⁾ It is a saddle-shaped concavity located on the intracranial surface of the sphenoid bone. ⁽²⁾ Pituitary gland is formed before the cartilaginous skeleton of the hypophyseal fossa. There is significant literature which suggests that pituitary gland serves as a functional matrix for the skeletal unit of sella turcica. ⁽³⁾ The development of pituitary gland in succession leads to enlargement in the dimensions of sella turcica. ⁽⁴⁾

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Any systemic disease such as cushing's syndrome, hyperthyroidism, etc or pituitary tumor or an abnormally large pituitary gland can lead to change in the size of sella turcica.⁽⁵⁾⁻⁽⁶⁾ The change in hormonal level can also lead to change in the dimensions of sella turcica.⁽⁷⁾⁻⁽⁸⁾

Sella turcica is an important structure in radiographic analysis of craniofacial complex. In orthodontics, sella turcica is an important structure because, sella, a hard-tissue derived landmark, is located in the centre of hypophyseal fossa.⁽⁹⁾ This point is located in the centre of the sella turcica, with the turcica housing the pituitary gland in the cranial base.⁽¹⁰⁾ There is an increase in the interest to study the human craniofacial dysmorphology, but there are few cephalometric standards available in growth and development.⁽¹¹⁾

In order to determine if the sella region presents with any unusual appearance, the study of normal size of the sella turcica has to be done. Several studies have been conducted to analyze the shape and size of sella turcica in skeletal class I, class II and class III. One such study which was conducted by Eman A. Alkofide et al in the year 2007 wherein the size and shape of sella turcica was compared in skeletal class I, class II and class III subjects, concluded that there was statistically significant difference in the diameter between class II and class III ($p < 0.01$).⁽¹²⁾ Another study conducted by Sathyanarayana HP et al in 2012, concluded that statistically significant difference was found in the diameter and length of sella turcica.⁽¹³⁾ Luong HM et al conducted a study in 2016 and concluded that there was no statistically significant difference in the linear dimensions of sella turcica in different skeletal patterns.⁽¹⁴⁾

Cephalometrics have been used as an indispensable tool in orthodontics for diagnosis, treatment planning, and evaluation of dental and skeletal growth, posttreatment evaluation, and research work.⁽¹⁵⁾ Cephalometric tracings can be done either manually or digitally. Manual method has been used for a long time to achieve linear and angular measurements. The drawbacks of this method are time consumption is a lot and also, a

high degree of operator error.⁽¹⁶⁾ With increasing use of computer radiography, digital tracing is now dominating the market. It is more user-friendly, storage is easier, etc. Studies have indicated that Computer-aided cephalometric analysis does not introduce measurement error as long as the landmarks are identified manually.⁽¹⁷⁾

Size of sella turcica varies from individual to individual, and the establishment of normal standards will aid in the process of eliminating any abnormality in such an important region

Therefore, the purpose of this study was to analyse to measure the linear dimensions of sella turcica to determine if differences exist due to different skeletal patterns in south indian population using FACAD software.

Materials and Methodology

This The radiographs were distributed according to skeletal Class and gender; 20 Class I, 20 Class II, and 20 Class III cases were collected and they were equally distributed between males and females in each class. Classification of skeletal type into Class I, Class II, or Class III was based on the ANB angle (difference between SNA and SNB).⁽⁷⁾ The ANB angle indicates the skeletal jaw discrepancy, regardless of which jaw is at fault. Skeletal base Class was categorized as follows: angles ± 2 degrees is Class I skeletal base; angles more than 4 degrees is Class II, and angles less than 0 degrees is Class III. In addition, to overcome the limitations of the ANB angle and to further describe jaw severity/ discrepancy Wits appraisal analysis was used.

The tracing of sella turcica

The sella turcica on each cephalometric radiograph was traced on FACAD software. This tracing was marked in square millimetres to calculate the sella area and measurements were made to the nearest 0.1 mm. The configuration of the sella turcica consisted of the tuberculum sella, the sella turcica floor, the dorsum sellae, and both anterior and posterior clinoid processes, was traced.

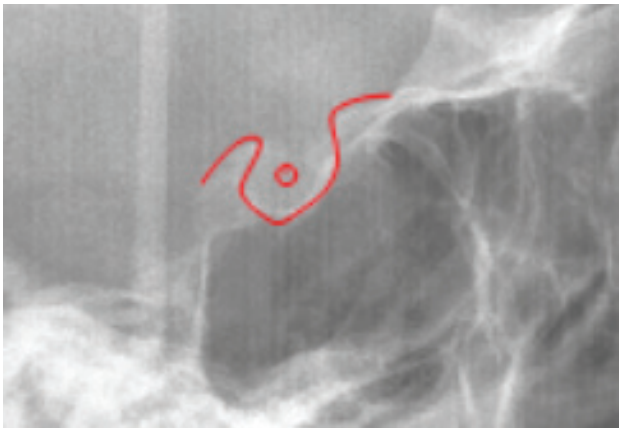


Figure 1. Tracing of sella turcica on FACAD software

The Size of the sella turcica

The linear dimensions of sella turcica were measured using the methods of Silverman (1957) and Kisling (1966) ⁽⁸⁾ All the reference lines used in the current study were located in the midsagittal plane.⁽⁹⁾ The length of sella turcica was measured the distance

from the tuberculum sellae to the tip of the dorsum sellae. The depth of the sella turcica was measured as a perpendicular from the line above to the deepest point on the floor of sella turcica and a line was also drawn from the tuberculum sellae to the furthest point on the posterior inner wall of the fossa, and this was considered as the antero-posterior diameter of sella turcica

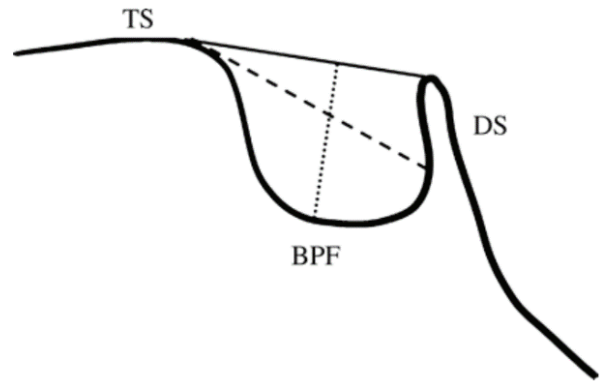


Figure 2. Morphology and reference lines used to measure sella turcica

Result

Data were analysed using the Statistical Package for Social Sciences version 16.0 for Windows. To study the relationship between skeletal type and sella turcica size, one-way ANOVA was used (p<0.01).

		n	Mean	Standard Deviation
Length	Class I	20	10.6	2.0
	Class II	20	10.5	1.8
	Class III	20	11.3	2.7
	Total	60	10.7	2.3
Depth	Class I	20	8.8	1.1
	Class II	20	8.9	1.2
	Class III	20	9.2	1.2
	Total	60	9.1	1.3
Diameter	Class I	20	13.8	1.7
	Class II	20	13.3	1.5
	Class III	20	14.5	2
	Total	60	14	1.9

Table 1. One-way analysis of variance testing the effects of skeletal Class on sella linear dimensions (in millimetres).

To determine if different skeletal patterns affect the linear dimensions of sella turcica, a one-way ANOVA test was performed. A statistically significant difference was found in the depth of sella turcica between skeletal class II and class III ($p < 0.01$).

Discussion

This retrospective study describes the linear dimensions of sella turcica in south Indian subjects.

The length, depth and diameter of sella turcica in the present study were compared with other investigations. In the current study, it was noted that there was a statistically significant difference in the depth of sella turcica between class II and class III. Study conducted by Ahsan et al in Pakistani population reported that there was no significant difference in the linear dimensions of sella turcica in different skeletal patterns.⁽¹⁷⁾ Som Sudheer et al in the year 2016 conducted a similar study in south Indian population wherein it was reported that there was a statistically significant difference in the length of sella turcica whereas the depth and anteroposterior diameter showed statistically insignificant difference.⁽¹⁸⁾

A similar study conducted by Luong et al evaluated the size of sella turcica in all three dimensions between skeletal class I, class II and class III using CBCT. It was reported that the Skeletal Class III subjects presented with a significantly larger width, axial area, and volume when compared to Class I ($P < 0.001$). There was no significant difference in linear dimension, area, and volume of sella turcica between Class I and Class II.⁽¹⁹⁾ On comparing this study with Alkofide conducted in Saudi subjects reported that the linear dimensions of sella turcica in the Indian population sample were on average 1.7 to 2.9 mm smaller than those of the Saudi subjects.⁽²⁰⁾ The linear dimensions (length, depth, and diameter) can be used to predict the size of the pituitary gland.

It might be of clinical importance when an abnormally large sella is found on the lateral cephalogram.

Conclusion

1. When sella size was compared to skeletal type, no significant difference was found among them.

2. The results of the present study of sella shape and size may be used as reference guide for future studies about sella turcica morphology.

Ethical Clearance- Taken from Scientific Review Board of SIMATS

Source of Funding- Self

Conflict of Interest - NIL

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Influence of Patients' Perception on Doctors Physical Appearance - Kap Study

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Abstract

Introduction: Despite technological advances and changes that the medical fraternity has experienced in the last few decades, the physical appearance of orthodontists influence the patients. Literature report says that the type of clothing and accessories have the potential to influence the patient-doctor relationship.

Aim: This study was primarily aimed at investigating patient opinion on the physical appearance, behaviour and overall professionalism of the physician or the doctor treating them.

Materials and Methodology: This questionnaire based study was aimed at subjects visiting as outpatients in a private dental set up, who were 18 years or older. Subjects who were not able to read and write were not included in this study. The participants were randomly involved in the study and were provided with a questionnaire formulated with a set of 18 multiple choice based questions. They were asked to choose the more appropriate answer from the options provided.

Result: Most of the preferences made by the volunteers showed that physical appearance did not affect the perception of patients. There was no significant gender variation found.

Conclusion: Within the limitations of this study, it can be concluded that the physical appearance of a physician or doctor did not affect the patients' perception towards his or her treatment. And there was no gender variation found in terms of patient perception.

Key Words: *patient perception, doctor appearance, Doctor's attire, Patient-doctor relationship.*

Introduction

Despite technological advances and changes that the medical fraternity has experienced in the last few decades, the physical appearance of orthodontists has shown tendencies to influence the patients' perception. Literature says that the type of clothing and accessories

have the potential to influence the patient-doctor relationship.

Many studies have been conducted using various methodological approaches in different countries to appreciate the influence of patient-doctor relationship based on the physical appearance of the physicians or orthodontists. Communication is found to be a vital and complex component of the physician-patient relationship.⁽¹⁾ Physicians communicate with patients through verbal and nonverbal messages.⁽¹⁾ In general, it has been reported that patients preferred doctors, male or female, with a conservative style, for instance, wearing white coats. Studies demonstrated that a significant portion of the population associated white coat to the image of physicians with professional attitude, better

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prepared and hygienic. ⁽²⁻⁵⁾ As the trends are changing with time, patients prefer to assess the orthodontists based on their clinical skills and knowledge rather than the physical appearance.

Literature evidence provides many studies on the patient perception around the world but very few among the Asian population. And no studies were found to be done in Chennai city. So, this research focused on the importance of patients' perceptions of their dental care provider based on their physical appearance, attire (dress), behavior, and overall level of professionalism.⁽²⁾

Hence, the aim of this study was to investigate patient opinion on the physical appearance, behaviour and overall professionalism of the physician or the doctor treating them.

Materials and Methodology

This questionnaire based study was conducted on 100 male and female patients visiting a private dental college in Chennai. The participants were randomly involved in the study, who were outpatients visiting a private dental set up, to assess their perception towards the physicians physical appearance .

A questionnaire was given with a set 18 questions to the patients wherein they were asked to choose from the options they found more appropriate. Questions asked were like - " Do you prefer your orthodontist to be slim; plump; well-built; doesn't matter. " The items evaluated in both genders were clothing style; piercings; tattoos; dyed hair; extravagant hair color, such as green or red; T-shirt; surgical scrubs; formal wear. ⁽⁶⁾ The items exclusively evaluated for male physicians were beard; moustache; long hair; tie; jeans, and absence of a tie. Items that were evaluated only for female physicians were hairstyle, dressing style.

The identity of the participants was not disclosed and the confidentiality of their identity was assured to them. Prior to the start of the study, Ethical approval was obtained from the Scientific Review Board of SIMATS. ⁽⁷⁾ A written informed was obtained from every participant and their personal identity were masked during data processing and analysis. Sufficient amount of 15minutes was provided for filling up the questionnaire. Following this, data was statistically

analyzed. Descriptive statistics using percentage and mean was used to analyse the results.

Inclusion criteria :

Orthodontic Patients above the age of 18 years.

Exclusion criteria :

Patients who were unable to read and write.

Results

Data collection was carried over a period of two weeks. The collected questionnaires were analyzed for completeness of the answers. 18 questionnaires were discarded due to an excessive number of unanswered questions or due to the errors in the questionnaire. The final analysis was based on 82 questionnaires from patients who were above the age of 18 years.

Most of the preferences made by the volunteers, for both, male and female, showed that the physical appearance did not bother the patients. ⁽⁸⁾ Among the patients, the more frequently chosen option in response to the question of the height of the orthodontist was that it made no significance to them. Statistics showed that 61% of the patients did not bother if their orthodontist was slim, well built or plump.[Table 1] Only 40% of the total respondents were specific on the height as well as complexion of the orthodontist. 61% of the respondents said it did not matter if the orthodontist was tall or short and 60% said that the complexion of doesn't matter. ⁽⁹⁾ Neither the height nor complexion of the orthodontist did not make a difference to the patient's attitude towards the orthodontist.[Figure 1 and 2] More than 65% of the participants did not bother about the hairstyle of the orthodontist treating them. The hairstyle of the male or female orthodontist also did not affect the patient-orthodontist relationship. [Figure 3]

As the trends are changing with time, it did not matter to the patient if the orthodontist treating them had dyed hair; tattoos; body piercings; wore spectacles or not. ⁽¹⁰⁾ It was also seen that it did not matter to them if the orthodontist treating them was young aged, middle-aged or old aged. Even the alignment of the teeth of the orthodontist did not make a difference to them.

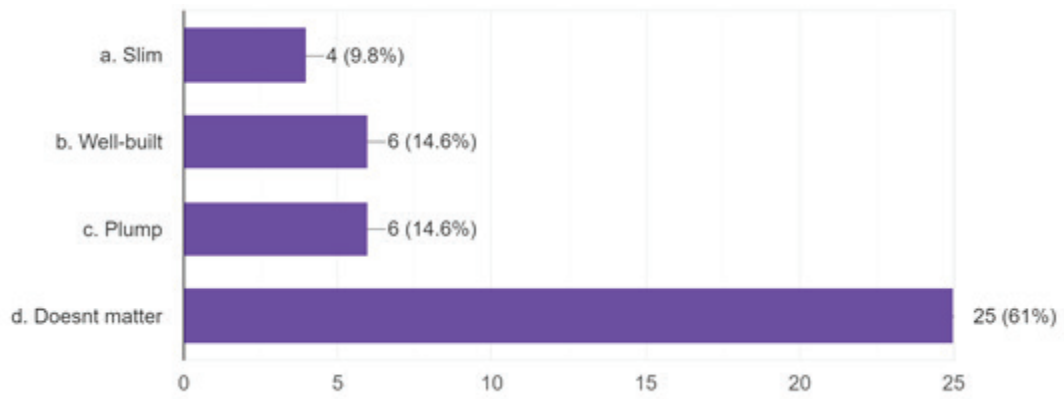


Figure 1: Bar graph showing patient perception on weight of the patient

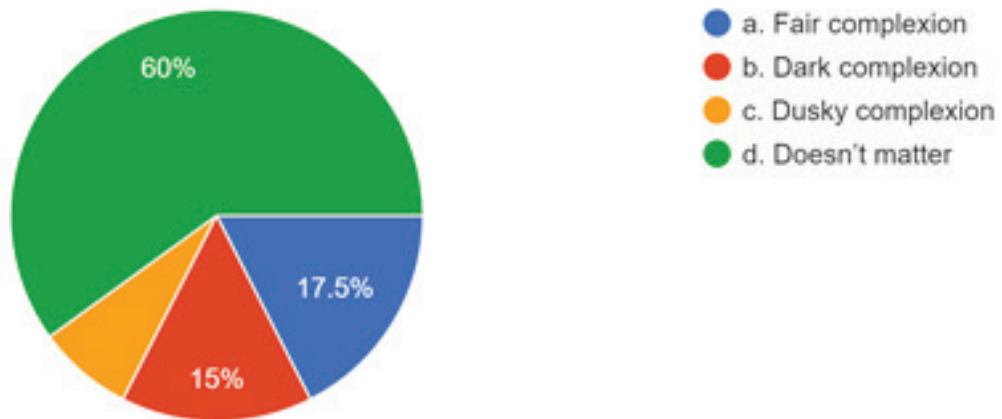


Figure 2: Pie chart showing the patient perception on complexion

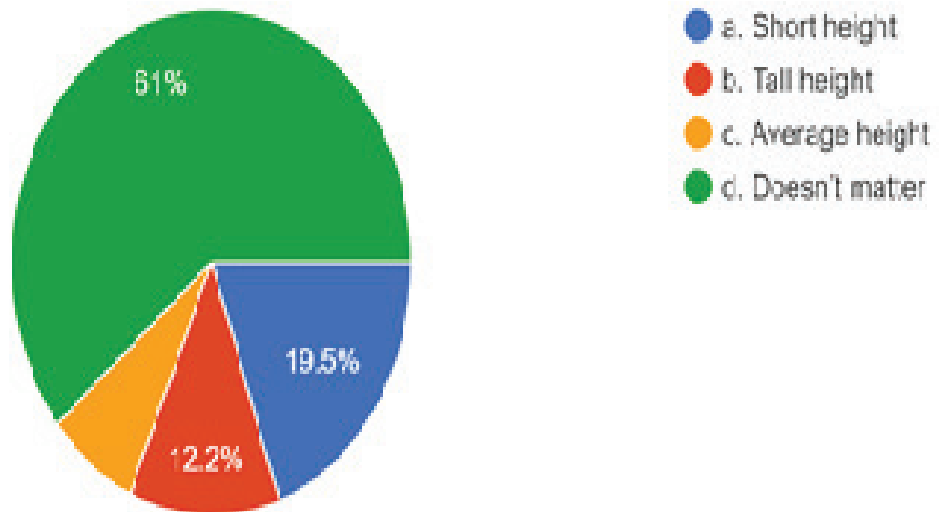


Figure 3: Pie diagram showing patient perception on the orthodontists' height

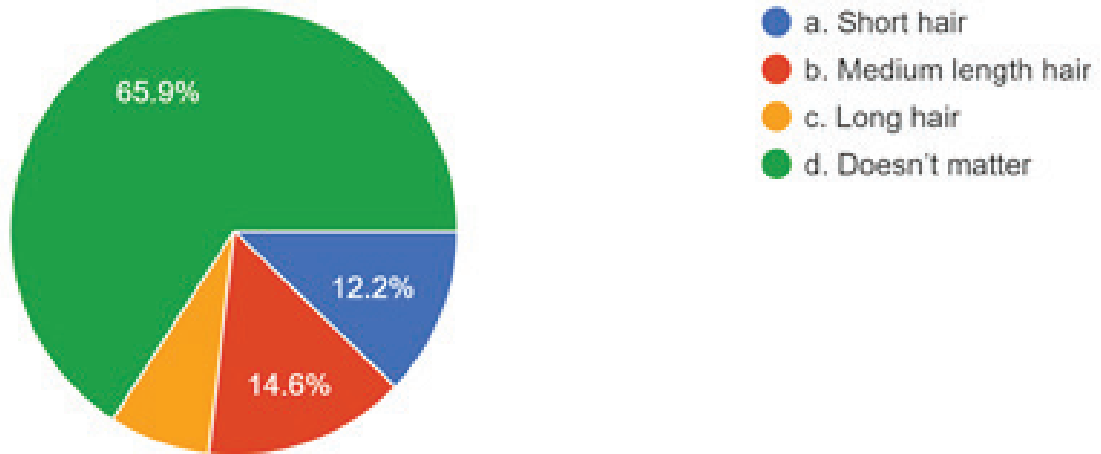


Figure 4: Pie chart describing the patient perception on hairstyle of the orthodontist

Would you prefer your orthodontist (if male) to have

41 responses

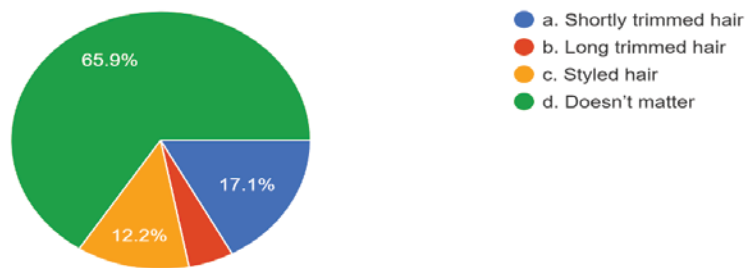


Figure 5 : Pie chart describing the patients' perception on the length of the hair of the female orthodontist

Would you prefer your orthodontist (if male) to have coloured hair

40 responses

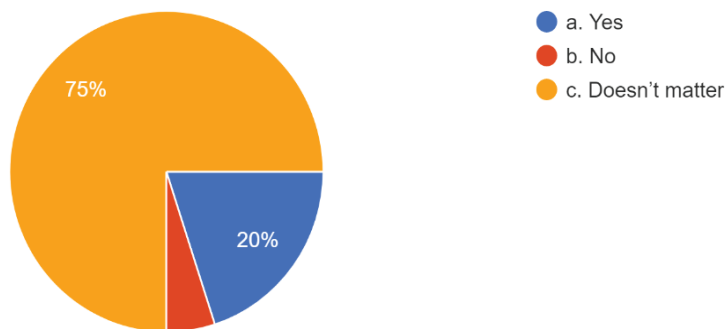


Figure 6: Pie chart representing the patients' perception on the dyed hair of orthodontists

Discussion

Only questionnaire which were duly filled with all details and those which was returned back were considered valid. The response rate was found to be 82% (N=82) ⁽¹¹⁾ The rationale behind this study was to assess the patients' perception towards the physical appearance of the orthodontist treating him or her.

Literature review says that there are several studies conducted in different parts of the world, but none in the Chennai city, to address to aspects related to value judgments on the manner of dress and the physical appearance of the orthodontists. ⁽¹²⁾ The results obtained demonstrated that the patients preferred orthodontists irrespective of their styles of dressing or physical appearance, per se. The groups did not report any level of discomfort with orthodontists presenting with excessively liberal appearance elements. ⁽¹³⁾

Among the individual styles selected by patients, the option – “did not matter” was frequently selected, both for male and female orthodontists. This finding indicates that such a style of dress should not affect the patient-doctor relationship. ⁽¹⁴⁾

This investigation presented a series of limitations, among which is the collection of data from a single dental centre. Accordingly, the opinions expressed do not necessarily reflect other regional realities of the country. Additionally, it is based on the response obtained by literates. ⁽¹⁵⁾ It is possible that the volunteers would have different opinions in actual situations. ⁽¹⁶⁾

Conclusion

The height of the orthodontist did not influence the patients' perception. Neither the height nor complexion of the orthodontist did not make a difference to the patient's attitude towards the orthodontist. ⁽¹⁷⁾ As the trends are changing with time, it did not matter to the patient if the orthodontist treating them had dyed hair; tattoos; body piercings; wore spectacles or not. It was also seen that it did not matter to them if the orthodontist treating them was young aged, middle-aged or old aged. Even the alignment of the teeth of the orthodontist did not make a difference to them.

Ethical Clearance: Ethical approval was obtained from the Scientific Review Board of SIMATS

Source of Funding: Self

Conflict of Interest: Nil

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Parental Perception of Inclusive Education

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Abstract

The attitude of parents of students studying in a government school in Mangalore towards inclusive education set up was analysed using a self-administered questionnaire. Classes 1-7 were chosen. The present study showed that there was an increased concern among the parents of children in the younger age group towards inclusive education and this attitude gradually shifted to the positive side when the parents of older children were consulted regarding the same. Therefore, it is justifiable to conclude by saying that parents have the greatest role in making the inclusive education programmes a success.

Keywords: parental perception, inclusive education, special children, questionnaire.

Introduction

The term inclusive education refers to the complete involvement of differently abled children in schools along with normal children for the purpose of an integrated education programme aimed at the benefit of both the sections of the students. In the past differently abled children were given education as a different section, recent changes in this concept with policies such as Salamanca statement and United Nations Convention on the Rights of Persons with Disability has paved the way for inclusive education in schools. The parents had an important role to play in realization of this model of education and the most important factor being the social participation of differently abled children.¹ This practice is better said than done in actuality as the disabled children may face rejection, victimization and bullying from peers.² There are contrasting studies to this statement where the inclusive education have resulted in frequent social interaction and improvement of social skills which involves communication skills.^{2,3}

The normal children can also benefit by improvement in social and academic skills.⁴ The most important role in the actualization of the inclusive education is played by the parents. The parents of differently abled children are in support of the inclusive education when the majority opinion is considered. But this is not the case when the parents of normal children are considered. They are neutral or less than positive in their attitude regarding inclusive education, they worry that the possible negative behaviour of disabled children can affect their own children.⁵ The parental attitudes can have a major impact on the outcome of an inclusive education system.⁶ Thus the present study aimed understanding the parental attitudes towards inclusive education in a school in Mangalore.

Aim

To assess the attitude of parents towards inclusive education set up.

Materials and Method

A self-administered questionnaire was distributed among the parents of students studying in a government school in Mangalore which had adopted an inclusive education system. The sample comprised of 241 parents of children, belonging to Class I - Class VII, wherein each class had enrolled a minimum of one child with SHCN. The questionnaire was framed in the local

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vernacular language (Kannada). The questionnaire sheets were collected and statistically analysed.

Results

A total of 241 parents of healthy children participated in the study. 146 of the 241 parents agreed to the inclusive education having a positive impact on their child's behaviour. 95 parents did not agree to the same. (figure 1)

The second question assessed the promotion of equality among the children in an integrated school. Out of 241 parents, 182 parents gave a positive response. (figure 2)

117 of 241 parents were completely satisfied in sending their child to an integrated school. (figure 3)

The fourth question assessed whether moral values were fostered in children in the integrated schools. Most of the parents (132 of 241) responded positively. (Figure 4)

The fifth question assessed whether the child participates in the classroom activities without any hesitation. (figure 5)

The sixth question assessed whether the child acknowledged the presence of a child with SCHN in their classroom. (figure 6)

Discussion

Out of the 252 children from class I to class VI, the parents of the healthy children were handed of questionnaires. Each class had 1 to 3 children with SHCN. The parents were well aware of the children with SHCN in class of which the majority of parents whose children belonging to the younger age group (Class I, II, III, IV) were not convinced with the positive impact of inclusive education on their children as compared to the parents of the older age group(Class V, VI, VII). This is in accordance with the study done by Stoiber, Gettinger & Goetz in 1998 who stated that the parents of children without disabilities hold neutral, though less positive attitudes⁵. Other concerns stated by the parents of the healthy children were that the demands of children with SHCN become so great, that they interfere or compromise their own child's growth and education.⁷

A large group of parents of both the younger age group as well as the older age group children agreed to the inclusive education promoting equality between the normal children and the children with SHCN. This was in agreement with the study done by Bennett T in 1997⁸ where he found that a majority of parents showed favourable attitude towards inclusion in terms of promoting positive role models, friendships, facilitating acquisition of pre-academic, social, language and motor skills.

Parents of children in the older age group(class V, VI, VI) were comparatively more satisfied with their children being send to the integrated as compared to the parents of younger age group (class I to VI) as they were worried if their children would emulate the inappropriate behaviour of children with SHCN, which is a similar finding in a study done by Amrutha N were the parents suggested separate classes for academics.⁹

Children of younger age group(class I,II,III) participated in classroom activities without any hesitation whereas the elder age group (class IV,V,VI, VII) did not hesitate to do so as most the younger age group children were not aware of the presence of a child with SHCN within their classroom.

The moral values fostered in children through integrated education had a mixed response. Most of them especially the parents of the older age group agreed to moral values that their children would attain in these integrated classes. A similar observation was made by duhaney LMG where parents of healthy children revealed that they preferred their children in classes which included children with disabilities as there was an increase in personal development and improved self-worth by helping others. Specific gains in terms of social cognition which included awareness of other children's needs, prosocial and personal characteristics and greater acceptance of human diversity.¹⁰

Conclusion

Parental attitudes play a pivotal role in the success of inclusive education programmes. The present study showed that there was an increased concern among the parents of children in the younger age group towards inclusive education and this attitude gradually shifted to the positive side when the parents of older children were

consulted regarding the same. Therefore, it is justifiable to conclude by saying that parents have the greatest role in making the inclusive education programmes a success.

Parents of Healthy Children

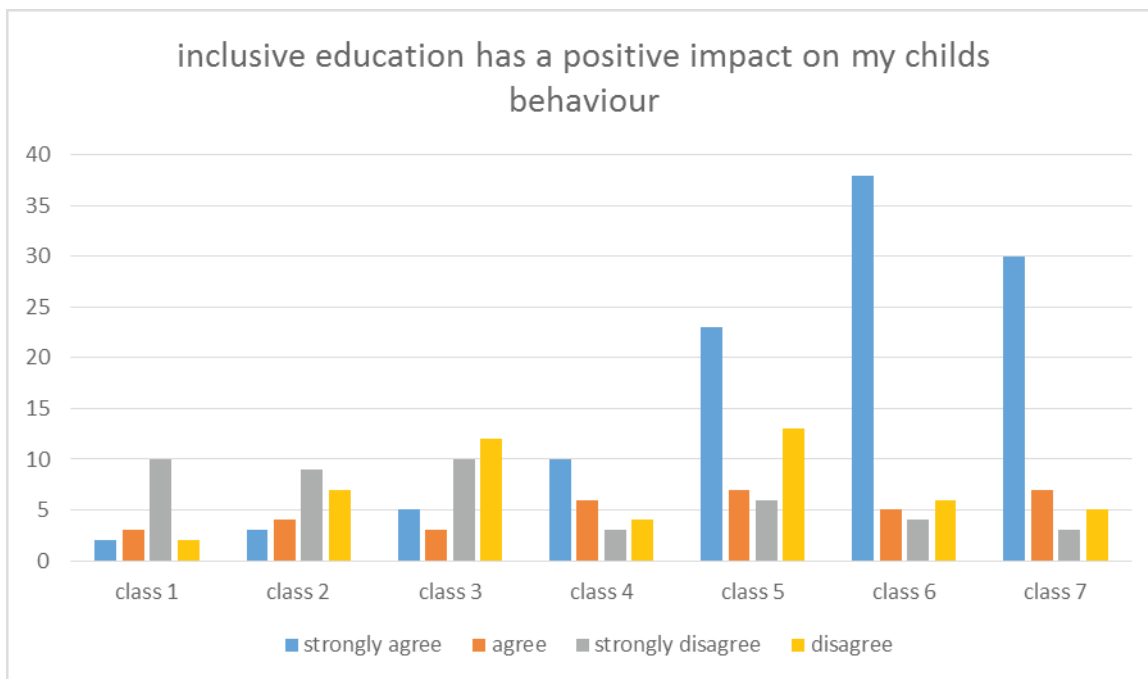


Figure 1:

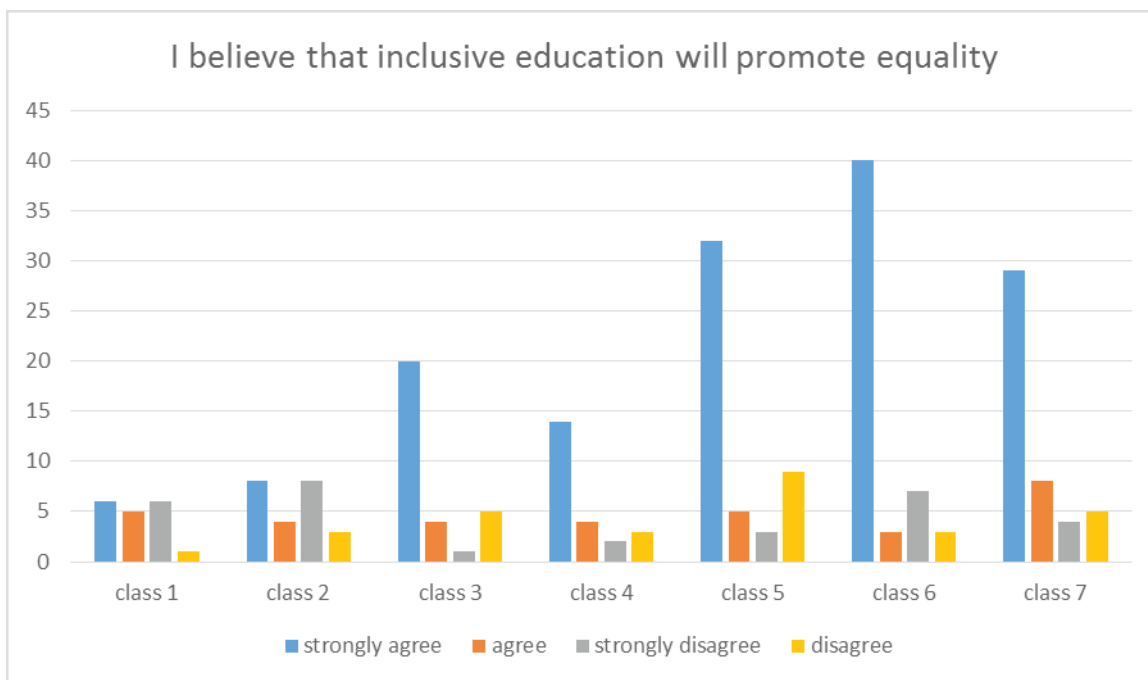


Figure 2:

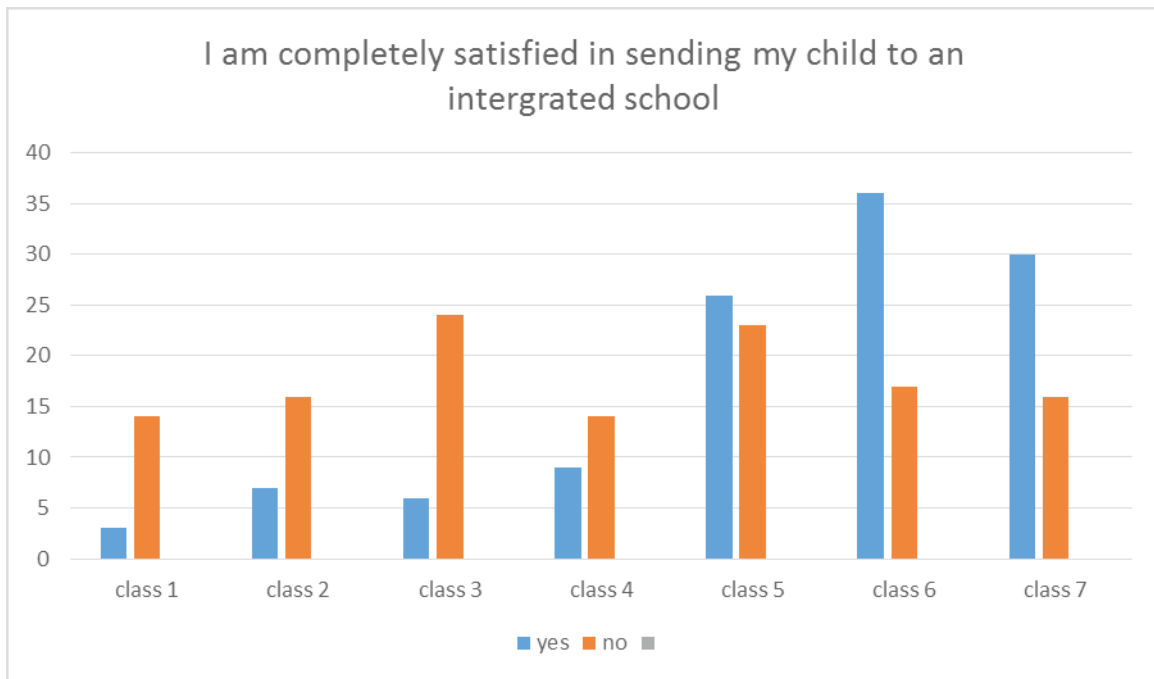


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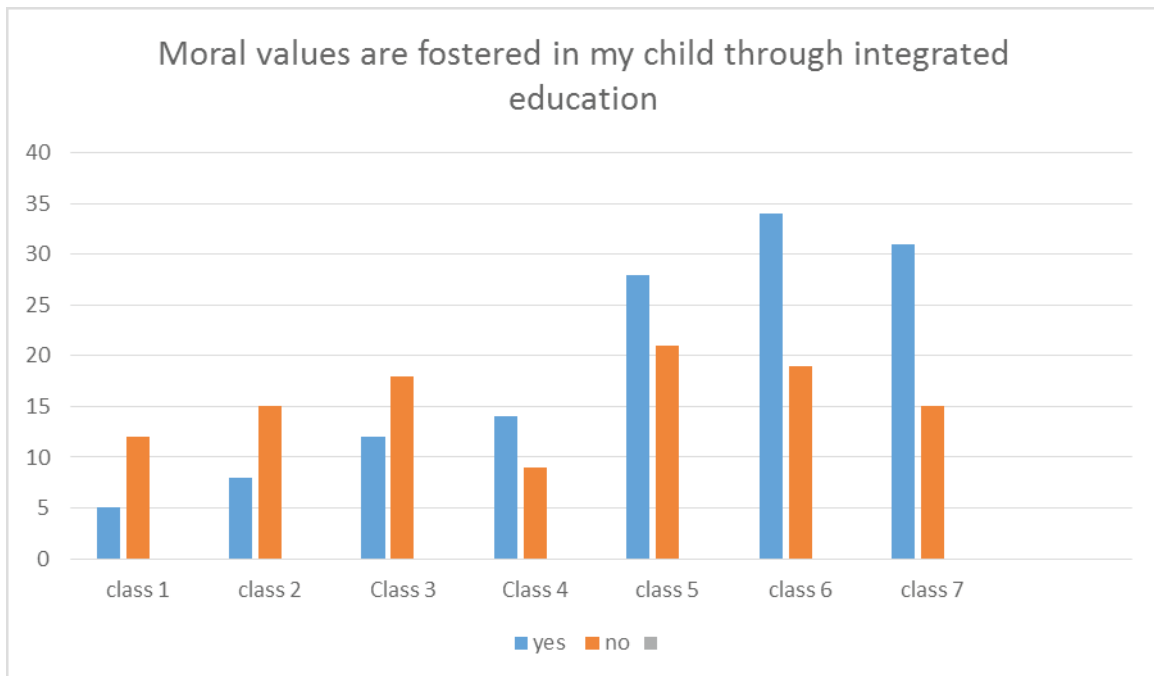


Figure 4

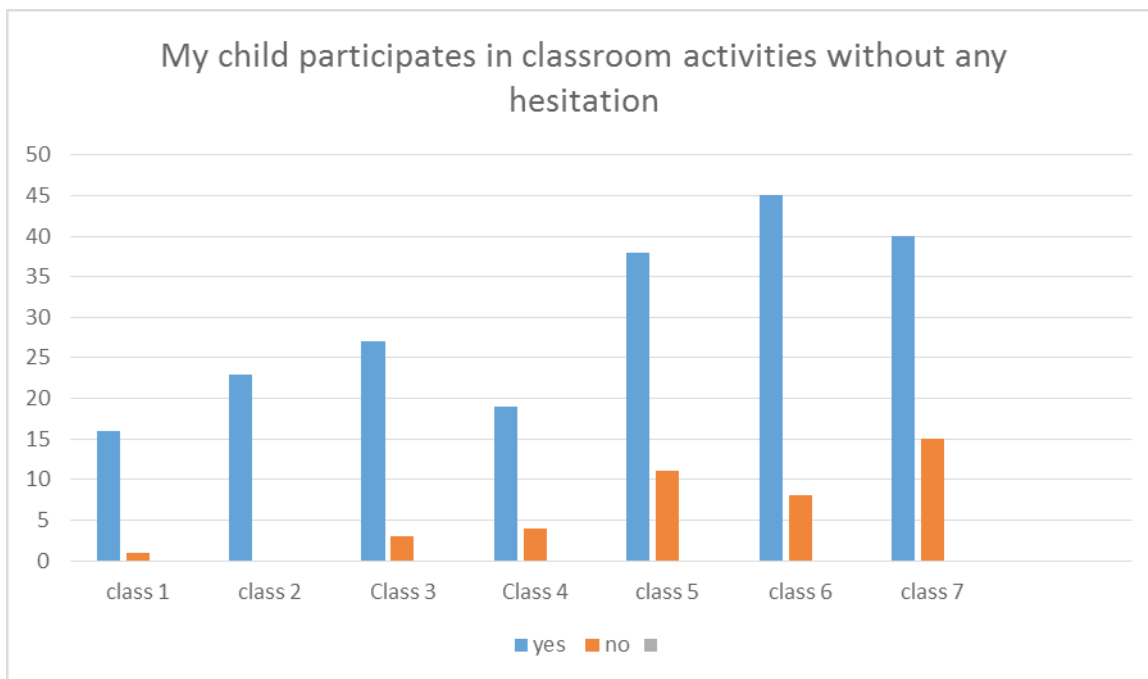


Figure 5

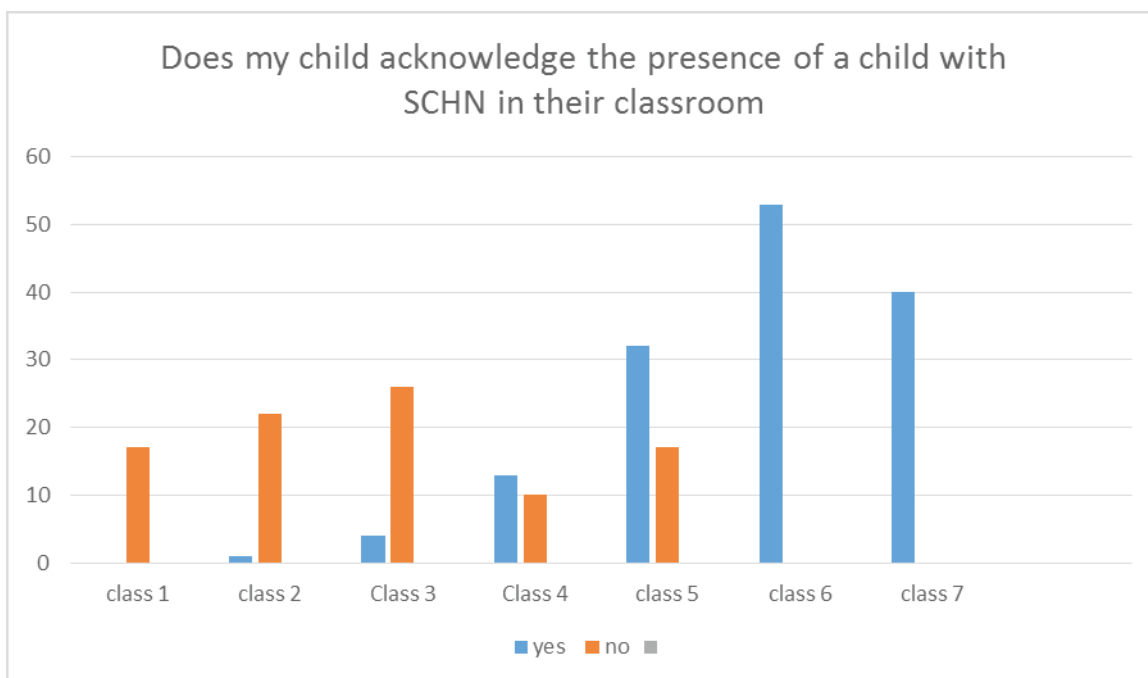


Figure 6:

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Modifiable Risk Factors of Hypertension: A Hospital based Case – Control Study at Bagalkot, Karnataka

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Abstract

Background of the Study: Hypertension is the silent killer disease which increases the cardiovascular disease burden and mortality across the globe.

Objectives of the study: To estimate and compare the distribution of modifiable risk factors among hypertensive (cases) and non-hypertensive (controls) patients.

Materials and Method: A case–control study was conducted at Medical OPD of Hanagal Shri Kumareswar Hospital and Research Centre, Bagalkot, Karnataka using an interviewer-administered structured questionnaire based on the WHO STEPS instrument for chronic disease risk factor surveillance. Crude Odds Ratios were computed for estimating the relative of risk modifiable risk factors on Hypertension.

Results: A sample of 250 (125 cases and 125 controls) subjects was included in the study. Mean age of the sample was 52.82 years. Findings shows that, smoking (Odds ratio=7.289, P<0.001), use of smokeless tobacco (Odds ratio=1.4, P<0.05), alcohol consumption (Odds ratio=1.15, P<0.05), inadequate fruits (Odds ratio=1.19, P<0.05) and vegetables in diet (Odds ratio=5.2, P<0.05), diabetes (Odds ratio=5.21, P<0.001), obesity (Odds ratio=4.12, P<0.001) and family history of hypertension (Odds ratio=1.8, P<0.05) were significantly different in proportion among cases and controls and were found to be significant risk factors of Hypertension.

Conclusion: Hypertension is strongly associated many modifiable risk factors. An extensive public awareness programmes targeting risk factors is essential in controlling hypertension, especially concentrating on physical exercise and control of diabetes, obesity, and on quitting smoking and alcohol and healthy diet.

Key words: Hospital, Case-Control Study, Modifiable Risk Factors, Hypertension.

Introduction

Hypertension is a disease entity of its own. It remains silent being asymptomatic during its clinical course. Because of its asymptomatic appearance, it

does immense harm to the body in the form of target organ damage, hence the WHO has named it the “silent killer.” Hypertension is a major cause of cardiovascular morbidity and mortality worldwide.¹ Excess dietary salt, low dietary potassium, overweight and obesity, physical inactivity, excess alcohol, smoking, socioeconomic status, psychosocial stressors, and diabetes are considered as modifiable risk factors for hypertension.²

Globally, hypertension is estimated to cause 7.5 million deaths a year which is roughly 12.8% of the total. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease in India.³ A recent meta-analysis has shown prevalence

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of hypertension as 40.8% and 17.9% in urban and rural population of India respectively.⁴

Hypertension is a tip of iceberg disease and often diagnosed for seeking treatment for other health problems. Sometimes it is diagnosed when it results in severe complications and admission to hospital of a patient. Lack of awareness regarding hypertension among public often leads to fatal consequences due to hypertension and related morbidities. Lack of awareness also results in poor health seeking behavior and reluctance in adoption of healthy life style.⁵

Hence considering the fact that, hypertension is the silent killer disease carry many modifiable risk factors which would pose the individual at many other morbidities, the researcher has planned to undertake a hospital based case-control study to assess the modifiable risk factors for hypertension among hypertensive and non-hypertensive patients attending the medical OPD of Hanagal Shree Kumareshwar Hospital and Research Centre, Bagalkot, so that an estimate of modifiable risk factors among hypertensive patients compared to non-hypertensive patients could be made. Which could be addressed in future interventional studies.

Material and Method

Study Design and Participants

Present study was a cross sectional case-control study conducted between Aug 2017 to Sep 2017. The sample for the present study was patients who came to the medical outpatient department of Hangal Shri Kumareshwar Hospital and Research Centre, Bagalkot during the study period. From them, only those who qualified the inclusion criteria as either a case or control were included in the analysis.

Criteria for Sample selection:

Inclusion Criteria:

Cases (Hypertensive patients):

- Patients who were already diagnosed with hypertension by a physician.
- Patients who are already on blood pressure-lowering medication(s).

- Both old and newly diagnosed patients were included.

- All willing patients aged between 35 and 65 years were included in the study.

Controls (Non hypertensive patients):

- Patients attending the same outpatient service with no history of hypertension and with the blood pressure recorded on the day of study are normal.

- All willing patients aged between 35 and 65 years were included in the study.

Exclusion Criteria:

Cases (Hypertensive patients):

- Patients who are known cases of secondary hypertension and antenatal females were excluded from the study.

Controls (Non hypertensive patients):

Patients whose blood pressure is not normal on the day of study were also excluded from the study.

Sample size

Sample size is 125 cases (Hypertensive patients) and 125 controls (Non-hypertensive patients).

Instruments

A modified WHO STEPS instrument (Questionnaire) for chronic disease risk factor surveillance was used to collect data. The questionnaire consisted of 7 items related to socio-demographic characteristics of sample, 19 items related to behavioral characteristics of sample and 6 items related to the physical characteristics of sample.

Data Collection Procedures

Prior permissions were taken from Hospital authority before the beginning of data collection procedure. The study participants were indentified during the study period at medical outpatient department of Hangal Shri Kumareshwar Hospital and Research Centre, Bagalkot. Every subject who fulfilled the inclusion criteria as either case or control was approached for data collection. Consent was obtained by the researcher

before participants underwent the structured interview which lasted approximately for 15 to 20 minutes. Purpose of the study was explained to the participants and they were interviewed in Kannada or in the language understandable to them. All the information collected was based on patient's self report, but the information related to physical characteristics such height, weight and blood pressure were assessed by the researcher at the time of interview.

Data Analysis

Numerical data obtained from the sample was organized and summarized with the help of descriptive statistics like frequency, percentage, mean, standard deviation. A simple proportion was done for all the relevant variables studied among cases and controls and the overall sample with confidence interval (CI) fixed

at 95%. The proportions of relevant risk factors were compared between cases and controls. Significance was ascertained by using Crude Odds Ratios (ORs). Statistical analysis was done using SPSS Ver. 25.

Results

A: Sample characteristics

Mean age of cases was 56.78 ± 8.65 and mean age of controls was 48.87 ± 11.01 . Most of both cases (63.2%) and controls (51.2%) were males. Majority of both cases (91.2%) and controls (98.4%) were Hindu. Nearly same percentage of cases (34.4%) and controls (39.2%) had no formal education. All most all cases and controls were married. Nearly same number of cases (29.6%) and controls (35.2%) were housewives. Mean family monthly income of cases was 11896 ± 5537 and that of controls was 11568 ± 2837.92 .

B. Physical Characteristics of Sample

Table I: Description of physical characteristics of subjects.

Variables	Groups	Mean	Std. Deviation
Height in cms	Cases	158.93	6.44
	Controls	155.18	5.02
Weight in kg	Cases	61.97	11.23
	Controls	56.86	7.68
BMI	Cases	24.54	4.3
	Controls	23.63	3.1
Systolic Blood Pressure	Cases	156.91	8.28
	Controls	121.60	4.44
Diastolic Blood Pressure	Cases	99.97	13.61
	Controls	78.93	7.58

Table I presents the mean and standard deviation physical characteristics of both cases and controls.

C: Modifiable Risk Factors of Hypertension

Table II: Description of modifiable risk factors of Hypertension.

N=125+125=250

Risk Factors	Cases		Controls	
	F	%	F	%
1. Current smoking				
a. Yes	19	15.2%	3	2.4%
b. No	106	84.8%	122	97.6%
2. Daily smoking				
a. Yes	15	12%	2	1.6%
b. No	110	88%	123	98.4%
3. Daily smoking in past				
a. Yes	28	22.4%	9	7.2%
b. No	97	77.6%	116	92.8%
4. Use of smokeless tobacco				
a. Yes	40	32%	32	25.6%
b. No	85	68%	93	74.4%
5. Habit of alcohol consumption				
a. Present	29	23.2%	26	20.8%
b. Absent	96	76.8%	99	79.2%
6. Include fruits in diet				
a. Inadequate	46	36.8%	40	32%
b. Adequate	79	63.2%	85	68%
7. Include vegetables in diet				
a. Inadequate	5	4%	1	0.8%
b. Adequate	120	96%	124	99.2%
8. Work with vigorous physical activity				
a. Yes	21	16.8%	51	40.8%
b. No	104	83.2%	74	59.2%
9. Habit of walking or jogging				
a. Yes	35	28%	38	30.4%
b. No	90	72%	87	69.6%
10. Diabetes Mellitus				
a. Diabetic	36	28.8%	9	7.2%
b. Non-diabetic	89	71.2%	116	92.8%
11. Obesity				
a. Obese	15	12%	2	1.6%
b. Non Obese	110	88%	123	98.4%

Table II depicts the difference in proportion of various modifiable risk factors of hypertension between cases and controls.

D: Estimation of relative risk of modifiable risk factors on Hypertension.

The effect of various modifiable risk factors on hypertension was estimated using the crude odd ratios (cORs) and presented in Table III.

Table III: Results of relative risk estimation of modifiable risk factors on hypertension.

N=125+125=250

Variables	cOR	P value	95% CI of ORs	
			Lower	Upper
1. Current smoking				
a. Yes	7.289	<0.001	2.09	25.32
b. No	Reference			
2. Daily smoking				
a. Yes	8.386	<0.001	1.9	37.5
b. No	Reference			
3. Daily smoking in past				
a. Yes	3.721	<0.001	1.7	8.3
b. No	Reference			
4. Use of smokeless tobacco				
a. Yes	1.4	<0.05	0.8	2.4
b. No	Reference			
5. Habit of alcohol consumption				
a. Present	1.15	<0.05	0.63	2.09
b. Absent	Reference			
6. Include fruits in diet				
a. Inadequate	1.19	<0.05	0.7	2
b. Adequate	Reference			
7. Include vegetables in diet				
a. Inadequate	5.2	<0.001	0.6	44.9
b. Adequate	Reference			
8. Work with vigorous physical activity				
a. Yes	0.29	>0.05	0.16	0.53
b. No	Reference			
9. Habit of walking or jogging				
a. Yes	0.83	>0.05	0.48	1.42
b. No	Reference			
10. Diabetes Mellitus				
a. Diabetic	5.21	<0.001	2.39	11.4
b. Non-diabetic	Reference			
11. Obesity				
a. Obese	4.12	<0.001	1.33	12.8
b. Non Obese	Reference			

cOR: Crude Odds Ratios, CI: Confidence Interval

Table III displays the findings of relative risk estimation of effect of modifiable risk factors on hypertension. Findings reveal that, current smokers (OR: 7.289, CI: 2.09-25.32), daily smokers (OR: 8.386, CI: 1.9 -37.5), daily smokers in past (OR: 3.721, CI: 1.7-8.3), who are using smokeless tobacco (OR: 1.4, CI: 0.8-2.4) and who have habit of alcohol consumption (OR: 1.15, CI: 0.63-2.09) were at higher risk for hypertension.

Similarly, inadequate fruits in diet (OR: 1.19, CI: 0.7-2), inadequate vegetables (OR: 5.2, CI: 0.6-44.9) in diet were also the significant risk factors of hypertension. Whereas people doing work with physical activity (OR: 0.29, CI: 0.16-0.53), who have the habit of walking or jogging (OR: 0.83, CI: 0.48-1.42) were at less risk for hyper tension. Diabetes (OR: 5.21, CI: 2.39-11.4) and obesity (OR: 4.12, CI: 1.33-12.8) were the also the majors risk factors of hypertension.

In the present study, people doing work with physical activity (OR: 0.29, CI: 0.16-0.53), who have the habit of walking or jogging (OR: 0.83, CI: 0.48-1.42) were at less risk for hyper tension. Diabetes (OR: 5.21, CI: 2.39-11.4) and obesity (OR: 4.12, CI: 1.33-12.8) were also the majors risk factors of hypertension.

E. Family History of Hypertension

Percentage wise distributions of cases and controls according to family history of hypertension shows that, in case group majority (57.6%) of them had no family history of hypertension and 42.4% of them had family history of hypertension. Whereas in control group, 71.2% do not have family history of hypertension and remaining 28.8% have family history of hypertension.

Table IV: Results of relative risk estimation of family history of hypertension on hypertension.

N=125+125=250

Variables	cOR	P value	95% CI of ORs	
			Lower	Upper
1. Family history of hypertension				
a. Present	1.8	<0.05	1.08	3.08
c. Absent	Reference			

cOR: Crude Odds Ratios, CI: Confidence Interval

Table IV shows the findings of effect of family history of hypertension on hypertension. Presence of family history of hypertension (OR: 1.8, CI: 1.08-3.08) greatly increased the risk of hypertension.

Discussion

The present case control study was conducted with the aim of estimating the effect of modifiable risk factors on hypertension. Study included a sample of 250 subjects (125 cases and 125 controls) selected using the purposive sampling technique. Odds ratios were computed for estimation of relative risk of modifiable risk factors on hypertension.

Findings of the study showed that, current smokers (OR: 7.289, CI: 2.09-25.32), daily smokers (OR: 8.386, CI: 1.9 -37.5), daily smokers in past (OR: 3.721, CI: 1.7-8.3), who are using smokeless tobacco (OR: 1.4, CI: 0.8-2.4) and who have habit of alcohol consumption (OR: 1.15, CI: 0.63-2.09) were at higher risk for hypertension.

Similar findings were observed by Pilakkadavath Z and Shaffi M⁶ in their study conducted to assess modifiable risk factors of hypertension at Kerala, India. In their study, smoking and alcohol consumption were the significant risk factors of hypertension.

In the present study, inadequate fruits in diet (OR: 1.19, CI: 0.7-2), inadequate vegetables (OR: 5.2, CI:

0.6-44.9) in diet were also the significant risk factors of hypertension. These findings were supported by the study conducted by Wang L et al⁷ on fruit and vegetable intake and the risk of hypertension in middle-aged and older women. Findings showed that, higher intake of all fruits but not all vegetables remained significantly associated with reduced risk of hypertension after adjustment for lifestyle and dietary factors.

In the present study, people doing work with physical activity (OR: 0.29, CI: 0.16-0.53), who have the habit of walking or jogging (OR: 0.83, CI: 0.48-1.42) were at less risk for hyper tension. Diabetes (OR: 5.21, CI: 2.39-11.4) and obesity (OR: 4.12, CI: 1.33-12.8) were the also the majors risk factors of hypertension.

Findings of the present study were supported by the findings of the study conducted by Abed Y and Abu-Haddaf S⁷ to assess the risk factors of hypertension, results showed that, the most common modifiable risk factors of hypertension were physical inactivity (76.7% versus 15.9%), obesity (67.5% versus 29.2%), diabetes mellitus (19.2% versus 7.5%), and ex-smoking (15.5% versus 1%).

Limitations

Although present study has able to explain to some extent the relative risk of modifiable risk factors of hypertension, some limitations need to be taken into account. Sample size was limited to 250 (125 cases and 125 controls), hence the results cannot be generalized to wider population. Limited variables were included in this, as other aspects like blood sugar control in diabetic patients; lipid profile could be also associated with hypertension. Hence further researches may consider these limitations to update the knowledge on modifiable risk factors of hypertension.

Recommendations

Hypertension is strongly driven by a set of modifiable risk factors. An extensive public awareness campaign targeting risk factors is essential in controlling hypertension, especially focusing on physical activity and control of diabetes, obesity, and on quitting smoking and alcohol consumption, healthy diet. Future research should aim at evaluating the efficacy of risk reduction programmes on control of hypertension and their overall

quality of life.

Conclusions

Hypertension is a highly prevalent risk factor for cardiovascular disease and it can also lead to other diseases which seriously harm the human health. Screening the risks and finding a clinical model for estimating the risk of onset, maintenance, or the prognosis of hypertension are of great importance to the prevention or treatment of the disease, especially if the indicator can be derived from simple health profile. In this direction the present study has been successful in finding the key risk factors of hypertension; smoking, alcohol consumption, inadequate fruits and vegetables in diet, physical inactivity, and family history of hypertension, diabetes and obesity validating the findings of various others studies conducted across the globe.

Ethical Clearance: Ethical clearance was obtained from the institutional ethical committee of BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

Source of Funding: The present study was a short term undergraduate research project funded by **Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka.**

Conflict of Interest: Nil

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The Effect of Fluoride in the Prevention of Dental Caries and Prevalence of Dental Fluorosis among High and Low Fluoridated Areas of Tamilnadu-A Cross Sectional Survey

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Abstract

Aim: To analyze the effect of fluoride in the prevention of dental caries and prevalence of dental fluorosis in high and low fluoridated areas. **Material and Method:** Dean's fluorosis index (1942)-modified was used to analyze the severity and prevalence of dental fluorosis and the caries prevalence was assessed using DMFS index (1931). The school students of age 12-16 years belonging to Chennai and Vellore areas were included in the study. A total of 400 students were examined in which 200 students belongs to Chennai and other 200 students belongs to Vellore representing low fluoridated area (LFA) and high fluoridated areas (HFA) respectively. **Results:** In the LFA the mean value of DMFS was found to be 0.805, hence it was notably greater than the mean DMFS of HFA which was 0.335. The mean Dean's Fluorosis score of LFA was found to be 0.005 which was significantly lower than mean value of Dean's fluorosis at HFA which was 0.7425. **Conclusion:** Mild increase in concentration of fluoride level in drinking water will decrease the incidence of dental caries in adolescents. Optimal fluoride levels in drinking water looks to be successful in decreasing caries outcome with low risk of dental fluorosis.

Key words: Dental caries, Dental Fluorosis, high and low water fluoride level.

Introduction

Dental caries is one among the most prevalent chronic disease affecting humans of all populations. The multiple disease patterns within and across the countries are associated with several factors like demographic factors, socio-behavioral pattern, environmental factors, and the accessibility and availability of oral health care, particularly, the subjection to various preventing oral health care programs. The principal reason for the increased incidence of dental caries appears to be increase in sugar intake and insufficient availability of

fluorides.⁽¹⁾

Fluorides are the key agent for prevention of dental caries mainly by underlying 3 mechanisms 1) by promoting repair (remineralisation) of early initial white spot lesions caused due to the enamel breakdown induced by the acids produced by the cariogenic bacteria of oral cavity by its activity on fermentable carbohydrate. 2) by making tooth enamel more resistant to caries attack by enhancing the chemical nature of enamel more resistant to acid attack and 3) by decrease in the number of plaque bacteria producing acids.

According to WHO report on oral health given in 2003, it had been shown that the decrease in incidence and prevalence of dental caries is achieved by combined action of individual; oral health professional and communities. Accessibility to oral health care is very limited in many developing countries of the world.

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Considering this many public health approaches came into play which includes water fluoridation, salt fluoridation, milk fluoridation and use of affordable fluoridated toothpaste twice daily.

Level of 1.0mg F/l by means of water fluoridation is considered to be favorable for prevention of dental caries, excessive intake of fluoride at the time of maturation of tooth enamel may lead to dental fluorosis⁽³⁾. Hence fluorides rightly known as a double edged sword.

On the other hand, High intake of fluoride will result in, mottled enamel, skeletal fluorosis, osteosclerosis, exostoses, calcification of ligaments. With increase in severity, the subsurface enamel along the tooth becomes increasingly porous (hypomineralised), thereby making it more susceptible for caries⁽⁴⁾.

With the use of fluoride dentifrices, the caries decline can be largely attributed but several studies have mentioned about the increase in prevalence of fluorosis due to early utilization of fluoride containing dentifrice.⁽⁵⁾ Above the optimum fluoride level, the incidence of caries is reduced but greater the prevalence of fluorosis. However severe fluorosis also seems to be linked with greater caries incidence. This positive relationship was put forth by many scientists. (Ekanayake, L. and Vann der Hoek, W. (2002).⁽⁶⁾

Hence this study was conducted to study the effect of fluoride in between Dental Caries and fluorosis among High and Low fluoridated areas of Tamil Nadu, India.

Materials and Method

The cross-sectional descriptive analysis was done among 12-16 years aged (indexed age group according to WHO)⁽⁷⁾ school children from high and low fluoride areas in Tamil Nadu, India.

According to Chennai metro water, the permissible limits of fluoride in portable water is $\leq 1\text{mg/L}$ ⁽⁸⁾. The water fluoride level of Vellore is in the range of 2.25-2.75mg/l. Vellore has been reported as endemic area for dental fluorosis. Eight districts identified as fluorosis endemic.⁽⁹⁾

The sample size was calculated using Multistage Simple Random Method, where we have randomly selected 100 children of age group 12-16 years, from

schools in Chennai (Low fluoride area) and 100 children of the same age group from the schools of Vellore (High fluoride area). This study was conducted for a period of two weeks.

The ethical approval for this study was obtained from the Ethical committee of department of Public Health Dentistry, SRM UNIVERSITY and approval was obtained from School Headmasters and consent was given by all the parents of the school children who were examined for this study.

The study performance consisted of demographic data i.e. Name of the patient, age in years, Date of birth, place of birth, residing area from birth till 10 years of life, source of drinking water. The students were allowed to sit in a shady place and they were examined under sunlight, natural light source. Wooden spatulas were used to retract the cheeks.

The dental fluorosis was assessed using Dean's fluorosis study (1942) modified. And the dental caries was assessed using DMFS (1931).

The excluding criteria for this study was 1. Missing anterior tooth, 2. orthodontic treatment. During orthodontic treatment, there is more presence of local factors which might increase the risk of caries and it might alter the results. All the statistical computations were analyzed using Mann Whitney U test, Chi-square test. Data were look over using STATA for windows

Results

This cross sectional descriptive study was done among students from low fluoride area (Chennai) and high fluoride area (Vellore) in South India. There were 200 students of 12-16 years of age from low fluoride area and 200 students of 12-16 years of age in high fluoride area participated in this study.

In the low fluoride area there were 89 females and 111 males and in High fluoride area, there were 120 females and 80 males.

When the population was assessed for duration of stay on the area in LFA, 16 students had stayed for <10 years and 184 students has stayed for >10 years. In the HFA, 9 students had stayed <10 years and 191 students had stayed for >10 years.

According to the source of drinking water in LFA, 63 students had used tap water, 11 students had used shallow well water, 21 students had used bore well water and 105 students had used bottled water (purified water). In HFA, 108 students had used tap water, 25 had used shallow well water, 258 had used bore well water and 39 had used bottled water.

Table 1, indicates the mean (SD) Dean’s Fluorosis score of LFA was found to be 0.005 which was significantly lower than mean(SD) value of Dean’s fluorosis at HFA which was 0.7425. (Mann Whitney Wilcoxon test, p<0.05)

Table 2, indicates crude relative risk ratios of water fluoride concentration on caries and fluorosis prevalence as well as regression models adjusted for age as well

as status of father’s occupation (SES) and there existed a negative and a positive association between fluoride level in drinking water and the risk of caries and fluorosis prevalence, respectively.

In the age- and SES-adjusted model a relative risk ratio of 0.6(0.4-0.8) was calculated. For fluorosis prevalence the risk estimate was 16(8-38) sensitivity analyses for caries (0.7(0.6-0.9)) and fluorosis 15(7-39) yielded to similar estimates as the respective main model.

When the mean caries experience of lifelong residents from high fluoride area was compared to dental fluorosis. According to table 3, the mean DMFS in the HF-area decreases with the increase in dental fluorosis.

TABLE 1 - Mean DMFS and Mean Dean’s Score among lifelong residents in LFA and HFA

	Chennai	Vellore	
	Mean (SD)		Mann-Whitney U sig.value
DMFS	0.805(1.406008)	0.335 (1.34977)	0.00*
DEAN’S SCORE	0.005 (0.04987)	0.7425 (0.6817)	0.00*

* Significant value

TABLE 2-Denotes 95% confidence intervals and relative risks for relation between risk of dental caries as well as fluorosis with water fluoride concentration.

MODEL	CARIES		DEAN’S SCORE	
	Chennai	Vellore	Chennai	Vellore
1	Reference	0.5(0.4-0.7)	Reference	15(8-40)
2		0.6(0.4-0.8)		16(8-38)
3		0.7(0.6-0.9)		15(7-39)

Model #1 - crude relative risk estimates for caries and fluorosis occurrence among lifelong residents

Models #2- adjusted for age and SES

Models #3 - sensitivity models accounting for misclassification of both outcomes adjusted for age and SES

TABLE 3- Mean (SD) of caries experience (DMFS) of lifelong residents from the high-fluoride area related to dental fluorosis (Dean's score)

		DMFS		
		N	Mean	SD
Dean's Score	0	51	1.666667	1.966384
	0.5	49	4.833333	7.652886
	1	67	2.833333	3.125167
	2	19	0.333333	0.816497
	3	5	0	0

($p < 0.05$; Mann-Whitney test) (N=size of sample)

Discussion

In this study, we have proved that mild increase in the level of fluoride in drinking water will lower the prevalence of dental caries in adolescents

In Low fluoride area (Chennai) the mean (SD) value of DMFS significantly higher than the mean (SD) DMFS of High fluoride area (Vellore). The mean (SD) Dean's Fluorosis score of Low fluoride area was found to be significantly lower than mean (SD) value of Dean's fluorosis at High fluoride area.

When the mean caries experience of lifelong residents from high fluoride area was compared to dental fluorosis. The mean DMFS in the HF-area decreases with the increase in dental fluorosis, it is important to note here that the Mean Dean's Score in HFA was mild. A negative relationship is proven. Similar relationship was proven by SA Eklund, BA Burt, AI Ismail and JJ Calderone⁽¹⁰⁾

In areas with very high fluoride levels, DMFS score increases with the increase in the Dean's score. This positive relationship was given by Ekanayake, L. and Vann der Hoek.W. (2002)⁽⁶⁾. Further studies can be done to study more on this topic. A neutral relationship was proposed by Ermis et al (2003)⁽⁰⁹⁾

According to table, the people who are enduring more than 10 years in Vellore, has virtuous tooth condition as the fluorosis content is manifestation high in water.

Wandwossen F, Bjorvatn Ket al, 2004 studied the relation between dental fluorosis and dental caries in areas of high and low fluoride levels of drinking water in Ethiopia⁽¹⁰⁾. The prevalence rate of 91.8% was obtained for dental fluorosis (moderate area) and prevalence of 100% (high fluoride area). The corresponding mean DMFT and caries prevalence in the areas were 1.2 versus 1.8 and 45.3% versus 61.6% respectively. The positive correlation among fluorosis and caries were noted in both of the areas.

Effectiveness of fluorides for the prevention of dental caries, 2004 proved that the use of fluoride tooth pastes and mouth rinses along with water fluoridation significantly decrease the risk of dental caries.⁽¹¹⁾ Cortes D.f., Ellwood et al, 1996 studied Drinking Water Fluoride Levels, Dental Fluorosis, and Caries Experience in Brazil⁽¹²⁾. Here the mean DMFT decreases with increase in fluoride level in drinking water. Caries incidence in 6 permanent teeth was significantly decreases ($P < .01$) in areas of 0.7 ppm of F. Higher TF scores and caries risk were noted in areas of 2-3ppm of F so only the optimum fluoride concentration plays a vital role in preventive

community programs in Brazil.

H. Meyer-Lueckel, H. Paris and A.M Kielbassa, studied caries risk among children aged 6-9 years residing in three areas in Iran⁽¹³⁾. Tooth Surface Index of Dental Fluorosis was observed in the low fluoridated communities compared with the naturally fluoridated town hence higher prevalence of fluorosis is seen in naturally fluoridated town. The intake of naturally fluoridated water which contain 1.3 ppm of fluoride has no or little effect on caries prevention but leads to dental fluorosis Karen M. Yoder^{1,*}, Lameck Mabelya², Valerie A. Robison³, Ann J. Dunipace⁴, Edward J. Brizendine⁵, George K. Stookey studied “ Severe dental fluorosis in a Tanzanian population consuming water with negligible fluoride concentration”⁽¹⁴⁾. Dental fluorosis is more prevalent in different parts of world even in fluoride-deficient water areas in children under 5 years of age cautions use of fluoride supplements and supervision of their use of toothpaste and defluoridation in endemic areas of fluorosis is recommended as two important preventive procedures for fluorosis. Aesthetic effect of fluorosis can be managed by tooth bleaching with or without micro-abrasion, veneering or crowning. The choice of treatment depends on the severity of the fluorosis and this may be analyzed by the use of Thylstrup and Fejerskov index⁽¹⁵⁾

Factors limiting our results- dental setup was not available hence through the utilization of artificial light would enable us to detect caries at the dentinal level; fluorosis was scored without using pressured air.

Conclusion

In this study, we have proved that mild increase in level of fluoride in drinking water will decrease the incidence of dental caries in adolescents. Optimal fluoride level in drinking water is known to be effective in decreasing total caries experience. Caries experience in school children at Chennai was low signifying their effective measures on oral hygiene. The caries experience in Vellore was relatively lower when compared to Chennai because of the presence of fluorosis. We conclude that teeth with fluorosis have got lesser chances of developing caries.

Conflict of Interest- Nil

Source of Funding-Self

Ethical Clearance: From Ethical committee of Department of Public Health Dentistry-SRMDCH and the inform concern was obtained from every participants.

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Occupational Health Problems among the Farmers of Rural Field Practice Area of Department of Community Medicine, KIMS, Hubballi: A Cross-Sectional Study

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Abstract

Background: India is a land of agriculture. Agriculture plays a vital role in India's economy. Farmers suffer from a multitude of problems; from the socio-economic problems to that related to their health.

Objectives: The study was conducted to assess the occupational health problems and the factors determining the health problems and to assess the health-seeking behavior among the farmers.

Methodology: A community-based cross-sectional study was conducted in the rural field practice area of KIMS, Hubli among 324 farmers. A pre-designed semi-structured questionnaire was used for the study. Suitable descriptive and inferential statistics were used for the analysis.

Results: Out of 324 farmers, the majority were males, Majority of the study participants were small scale farmers working more than 8 hours a day. Only 3.4% of the farmers used Personal protective measures while farming. Most of the farmers experienced occupational health problems- musculoskeletal problems being the commonest followed by respiratory problems. About 11.4% of the farmers experienced symptoms after pesticide exposure. The prevalence of health problems increases as the age advances and increase in years of work

Conclusion: Farmers face many health problems, the occupational health of the farmers should not be neglected as they are the bread makers of the world. There is a need to address the health problems and the measures to reduce these problems.

Keywords: *Farmers, Occupational health, health problems, health seeking*

Introduction

As per the 2011 census, 68.8% of India's population lives in rural areas¹. Two-thirds of the rural population depends on agriculture as their principal means of livelihood with the majority of them being small and marginal scale farmers.² Even a considerably higher

proportion of the female workforce is in agriculture. More than 50% of all female agricultural workers are unpaid family workers.³

Farmers suffer from a multitude of problems; from the socio-economic problems to that related to their health.⁴ Agricultural workers are exposed to a tremendous variety of environmental hazards that are potentially harmful to their health and well-being. Farmers suffer from increased rates of musculoskeletal disorders, respiratory diseases, noise-induced hearing loss, skin disorders, certain cancers, toxicity due to pesticides and fertilizers, injuries related to machinery and animals and heat-related illnesses.³

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Occupational health in Agriculture is a very special problem because of the unique nature of the occupation. Farmers work usually dispersed in remote rural areas where the public services may be below the expected level. Farmers perform a variety of tasks and the duration of work is not limited to hours or days. Seasonal variation also occurs. They does not work in sheltered areas but in out of door areas and is exposed to extremes of weather and climatic conditions. Lack of knowledge and also availability of Personal protective equipment and clothes make them vulnerable for many hazards. Workman's compensation, laws, and other social legislations do not apply to the farmers and emergency and first aid services, as well as medical care and hospital services, may not be accessible easily.^{3, 4,5}

The diversified and seasonal nature of agricultural activities, mechanization and the increasing use of pesticides, lack of availability of safe water and basic sanitation facilities at the workplace bring special risks to agricultural workers.

The farmers are at a higher risk of various health problems directly or indirectly as a result of their occupation, working environment, and the socio-economic condition

Despite agriculture being the most important and most hazardous occupation, the health problems and the occupational health and their health-seeking behavior is the least studied and addressed, hence this study was conducted for assessing the health problems and the factors determining them and their mode of health seeking during the illness.

Objectives: To assess the self reported occupational health problems experienced in the previous 6 months and the factors determining the health problems and to assess the health seeking behavior during the health problems

Methodology

A Community based cross sectional study was conducted in the field practice area of department of community medicine among the farmers aged between 18-60 years residing in the Kalghatagi taluk, a field practice area of KIMS, Hubballi during 2018- 2019. Marginal and Small scale farmers aged between 18 to 60

years were included in the study. Farmers with serious illness and pregnant and lactating farmers were excluded. Cluster sampling was used for the selection of villages, and then systematic random sampling was used for selection of study participants. Informed written consent was taken from the study participants. Institutional ethical clearance was obtained for the study.

Sample size: The sample size was calculated by reviewing the previous study among the farmers in Titabor block in Assam, 62 % of the farmers visit government hospital during their illness⁷ the sample size was calculated using the formula

$$n = \frac{1.96^2 pq}{l^2}$$

The sample size of 324 was used for the study.

The predesigned semi structured piloted questionnaire consisting of socio-demographic details, occupational characteristics and the health problems faced by them in the previous 6 months and the preferred mode of treatment during health problems was used for the study. House to house survey was done

Data analysis: The data was entered in MS Excel and analyzed using SPSS v21, Suitable descriptive and inferential statistics were used for the study. Monte Carlo exact and Fisher Exact test was used as tests of significance.

Results

Socio-demographic characteristics: out 324 farmers, 69.8% of them were males and 30.2% were females. Majority (39.8%) of the farmers were in the age group of 50-60years, followed by 30-40 years(25%), 40-50 years and 18-30 years. 54.9% of the farmers were literates, 45.1% were illiterates. Majority of the farmers (53.4%) stayed in nuclear families followed by three generation family and joint family. Most of them belonged to class IV socio-economic status (67%), 16.7% and 16.4% belonged to Class III and Class V according to modified BG Prasad classification.

Usage of personal protective equipment was very poor with only 3.4% of farmers using PPE only during pesticide application.

Musculoskeletal disorders were the most common health problem reported among farmers followed by respiratory problems (Table 1)

The health problems were associated with literacy status, age group and years of work in the farm. (Table 2)

Health seeking behavior: The preference for private and government hospital was almost equal and the many farmers also preferred pharmacies as well (Table 3)

Table 1: Occupational Health problems in the previous 6 months

Health problems	Yes: N (%)	No: N (%)
Injuries due to machinery	48(14.8)	276(85.2)
Injury due to animals	9(2.8)	315(97.2)
Respiratory problems	126(38.9)	198(61.1)
Musculoskeletal Disorders	195(65.1)	129(34.9)
Heat or cold problems	12 (3.7)	312(96.3)
Eye and ear problems	8(2.5)	316(97.5)
Problems after pesticide exposure	37(11.4)	287(88.6)

Table 3: Association between socio demographic-occupational characteristics and health problems among the farmers in the previous 6 months

		Health problems in the previous 6 months		P Value
		Yes	No	
Gender	Male	213(69.2%)	13(81.3%)	□2:1.054 P value: 0.304 *
	Female	95(30.8%)	3(18.8%)	
Literacy status	Illiterate	144(46.8%)	2(12.5%)	□2: 7.21 P : 0.0072 *
	Literate	164(53.2%)	14(87.5%)	
Age	<30 years	32(88.9%)	4(11.1%)	□2: 8.641 P value*: 0.033*
	30-40 years	74(91.4%)	7(8.6%)	
	40-50 years	75(96.2%)	3(3.8%)	
	50-60 years	127(98.4%)	2(1.6%)	
Socio-economic status	Middle	53(98.1%)	1(1.9%)	□2: 3.21, P value*: 0.233 *
	Lower Middle	203(93.5%)	14(6.5%)	
	Lower	52(98.1%)	1(1.9%)	
Years of work	<5 years	9(2.9%)	0	□2: 16.1 P value: 0.009*
	5-10 years	11(3.6%)	4(25.0%)	
	>10 years	288(93.5%)	12(75.0%)	

Cont... Table 3: Association between socio demographic-occupational characteristics and health problems among the farmers in the previous 6 months

Duration of work	< 8 hours/ day	208(93.7%)	14(6.3%)	□2: 2.811 P value*: 0.094 #
	> 8 hours/ day	100(98.0%)	2(2.0%)	
Type of farmer	Agricultural laborer	228(74.0%)	12(75.0%)	□2: 0.515 P value*: 0.773 *
	Marginal farmer	54(17.5%)	2(12.5%)	
	Small scale farmer	26(8.4%)	2(12.5%)	

* Monte Carlo exact test,

Fisher exact test

P value<0.05 considered Significant

Table 4: Health seeking behavior during health problems

Preferred Mode of treatment during the health problem		
	Frequency (N)	Percent(%)
Self Medication/Home remedies	18	5.6
Traditional Healer	5	1.5
Pharmacies	40	12.3
ANM/Anganwadi	7	2.2
Government hospital	128	39.5
Private / AYUSH	126	38.9
Total	324	100

Discussion

In the present study 324 marginal and small scale farmers were included in the study in which 69.8% of the farmers were males and 30.2% of the farmers were females.

In the present study the most common health problem faced by the farmers was the musculoskeletal problems (65.1%), followed by respiratory problems (38.9%), about 11.4% of the farmers experienced problems after pesticide exposure.

In a study conducted by Rajesh R K⁴ in the similar set up, the most common morbidity reported was dental problems(62%) which is contrast to the present study

in which only 3.5% of the farmers reported dental problems, Musculoskeletal problems was reported by 21.75% and respiratory problems by 19%. 6.75% of the farmers reported history of animal bite.

In the present study the most common health problem reported was musculoskeletal problems which is in similar to a study by Saket A Patil⁸ where musculoskeletal disorders was the most common morbidity among the farmers (83.8%) and study by A.Sangamithra¹⁰ in Tamil Nadu reported the similar findings.

In a study conducted by Syeda J R⁷ among farmers, the most common cause of morbidity among farmers was respiratory tract infection (54.25%), 23.25% of the

farmers reported musculoskeletal problems.

In the present study 14.8% of the farmers reported history of injuries due to machinery while working in the field. In the study by Vijay Kumar Manwani⁹ 64.15% of the farmers reported injuries due to machineries which is very high when compared to the present study. The animal induced injuries (35.85%) were also high compared to the present study (9%)

In the present study injuries due to machinery, Snake or animal bite, respiratory problems, musculoskeletal problems, problems after pesticide exposure, were high among male farmers, heat or cold related problems and eye and ear related disorders were high among female farmers. This may be because the type, duration of work done by them will be different from female farmers. Carrying heavy loads, Harvesting, working with the machineries predisposes the male farmers to experience the health problems more than the female problems.

In the present study the preferred mode of seeking health care was assessed Government hospital was the first priority for 39.5% of the farmers. 38.9% of the farmers preferred private practitioners/ AYUSH practitioners. 12.3% of the farmers preferred Pharmacies. Self medication was practiced by 5.6% of the farmers. Traditional healers were preferred by 1.5% of the farmers.

In the present study the farmers preferred government and private facility equally in contrast to the study by Syeda S J,⁷ and Rajesh R K⁴ where majority of the farmers preferred government hospital.

In the present study 12.3% of the farmers preferred pharmacies which is high compared to a study by Rajesh R K⁴ where only 1% of the farmers preferred Pharmacies.

Conclusion: The present study concludes that Majority of the farmers faced one or the other type of health problem in the previous 6 months with musculoskeletal disorder being the commonest morbidity. Usage of personal protective equipments is poor.

Preferences of health care facility was almost equal for both private and government facility.

Recommendations: The occupational health of

the farmers should not be neglected. Proper training should be provided about the use of Personal protective measures and the working postures to reduce the burden of the occupational health problems.

Limitations: The possibility of recall bias of illness as the illness episodes in the previous 6 months was included

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The Two Underlying Factors of India's Health System Issues. A Comparative Analysis

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Abstract

Background: Health system in India is multifaceted and is influenced by a conglomeration of several factors. The diversity in the system coupled with disparities in the taxation system, makes it incredibly challenging to manage and consequently, the health system takes a toll. As a result, the infrastructure, as well as quality of healthcare, is in a poor state. Non-affordability of quality healthcare is another issue as many are not covered by insurance, and without it, they are susceptible to catastrophic health expenditures. This paper tries to explain the central role of these dual roadblocks: discrepancies in the taxation system and insufficient health insurance coverage as attributable factors of a number of issues in the Indian health system. Further, this paper analyses the health system of the Netherlands and draws ideas of implementing some ideas of the same in India. Although the two complexities threaten the healthcare system of the country, India can incorporate certain strategies that have yielded good results elsewhere for the betterment of the healthcare sector of the country.

Keywords: *Ayushman Bharat, Dutch healthcare system, Health Insurance, Health system, Income tax, RSBY*

Introduction

With 29 states and a population of over 1.3 billion, the provision of quality healthcare is an arduous task in India^[1]. The country spends 1.4% of the GDP on healthcare while the life expectancy at birth remains a meager 67 yrs which is less than the global average of 72 yrs^{[1][2]}. Healthcare is a complicated, nevertheless booming sector in the country with the advent of private players and stakeholders from the civil society. There exist innumerable impediments like poor healthcare infrastructure, lack of availability of trained medical staff in rural areas, and unaffordability of quality healthcare by the poor^{[3][4]}. What is more, the unaffordability of healthcare seems to be an obvious problem in a country

with 21% population below the poverty line and less than 15% being covered by health insurance^{[5][6]}. Similarly, it is a herculean task to generate a decent budget for the healthcare sector, with less than 2% of the population paying Income tax^[7].

This paper aims to analyze the health system of India and understand the significance of taxation and health insurance in the healthcare sector. It discusses the shortcomings of the current taxation system followed by the lack of adequate health insurance coverage with briefings about the 'Rashtriya Swasthya Bima Yojna (RSBY)' and the 'Ayushman Bharat yojana'. A reflection of the possible solutions follows the analysis of the health system by understanding and taking ideas from the healthcare domains of the Netherlands. Lastly, the paper elucidates the feasibility of several ideas and concepts taken from the European nation in the Indian context.

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Analysis of the issues in the Indian Health system

Healthcare is a large and fast-growing sector in the

country. It consists of primary, secondary, and tertiary levels of care provided by both public as well as private providers^[3]. The first contact point between the community and the primary care in rural settings is usually the Sub-centre (SC)^[8]. Likewise, a Primary Health Centre (PHC) is the contact point between the community and the medical officer and a Community Health Centre (CHC) serves as a referral center for PHCs and provides specialized healthcare services to the population^[8]. Furthermore, at the district level health services are rendered by a District hospital or a First referral unit (FRU), which provides emergency care, including obstetric and new-born care^[8]. The following figure explains in detail the hierarchical segregation of healthcare units according to geography and population.

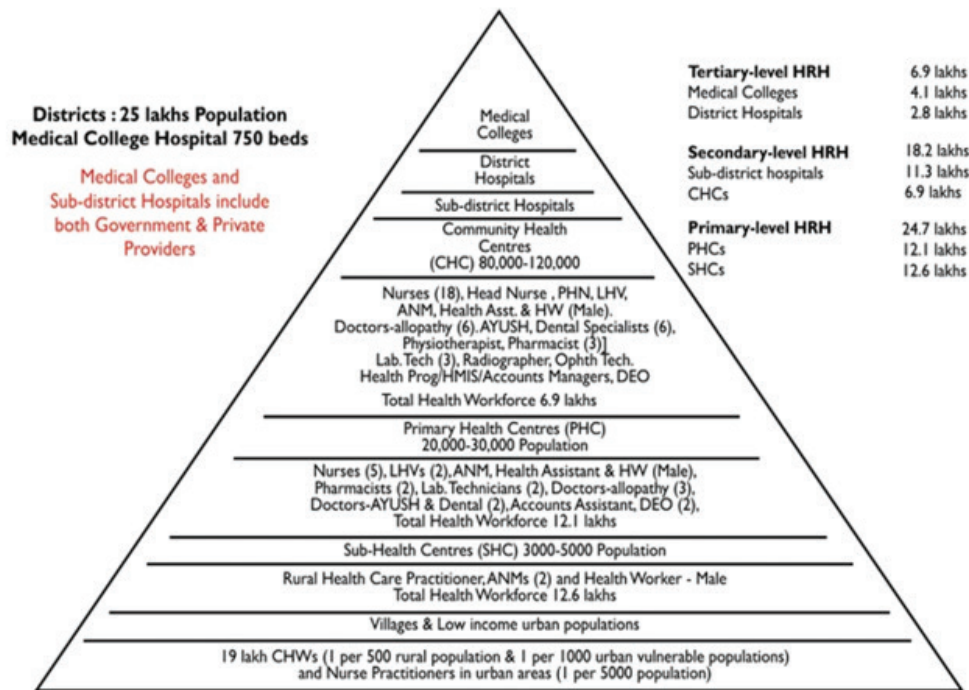


Figure 1. Indian Public Health System. Reprinted with permission from National Rural Health Mission, Ministry of Health and Family welfare, Government of India. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5144115/> [8]

The above figure explains the several niches of healthcare provision in India from village and panchayat levels to that of a district pertaining to the population catered^[8]. While many Indians pay for health services out-of-pocket (OOP) (80%), less than 20% are covered by health insurance^[9]. Further, less than 2% of the population pays income tax in India. Consequently, the country manages to spend as little as 1.4% of its GDP on healthcare. Thus, it can be seen that inadequate insurance coverage and a small proportion of taxpayers are two of the most significant drivers of the state of healthcare in India.

Issues in Taxation and healthcare spending

India has a structured system of taxation with specified guidelines for the central as well as the state governments. The country utilizes the generated revenue for infrastructure development, salaries of employees, healthcare, etc. According to the Income-tax act of 1961, every individual aged below 60yrs is liable to pay income tax if their annual income is more than 2.5 lakh rupees^{[10][11]}. Students, children and any persons with income from an agricultural source are however exempted from paying income tax.

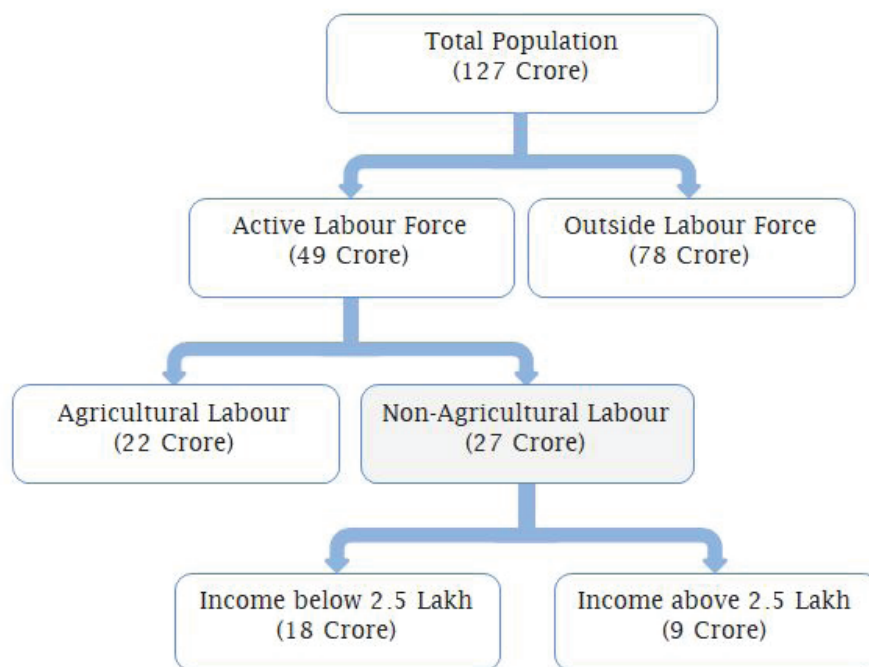


Figure 2. The potential Tax base of India. Source: cbgaindia.org. Retrieved from <http://www.cbgaindia.org/blog/many-indians-pay-income-tax-not-paying/> [12]

The figure explains the number of potential taxpayers in India; the income tax base of the country according to which, around nine crore individuals are liable to pay income tax^[12]. On the contrary, an estimated 2.02 crore individuals filed income tax returns in 2017-2018 but paid no tax^[13]. In particular, it can be deduced that around 1.9 crore individuals (1.5% of the population) pay tax whereas a staggering 7 crore are tax evaders^[13]. With such a large fraction of tax evaders, it is arguably arduous to govern a nation with over 1.3 billion population.

In 2017-2018, only 30 lakh individuals (0.23% of the population) paid a bulk of the tax, which is 77% of the total tax amount paid. Thus, a small portion of taxpayers bears a phenomenal tax burden. There are massive gaps between potential tax amounts and the actual figure of the same in the country, which invariably affects the sectors dependent on it. One such domain which is impacted hugely by this is healthcare. At 1.4% of its GDP being spent on the sector, India's healthcare expenditure is one of the lowest in the world with neighbors Sri Lanka and Bhutan exceeding the percentage by much^[14]. India's modest healthcare spending is one of the major factors

responsible for catastrophic healthcare expenditures.

Gaps in Health Insurance coverage

As mentioned in the previous sections, less than 20% of the population is covered by insurance, and most of them are government employees. Besides, there exist few insurance providers and limited schemes for those employed in the informal sector and the people below the poverty line^[15]. Furthermore, the scenario becomes rationally onerous with increasing healthcare costs, increasing the burden of new diseases, and neglect of primary and preventive care. The government came up with umpteen schemes in the past, for instance; RSBY, Ayushman Bharat, and the Aam Aadmi Bima Yojna (AABY), with a primary focus on the rural population.

RSBY and its shortcomings

The Ministry of Labour and Employment of the government of India launched the RSBY in April 2008 to provide health insurance coverage to BPL families^[16] which is presently under the Ministry of Health & family welfare (MOHFW). The scheme enables every Ration card holder to be eligible to receive a yearly benefit of

up to 30000 rupees by payment of a registration fee of 30 rupees^[16]. Under this scheme, the registered family is entitled to get cashless treatment in any of the impaneled public or private hospitals. Seventy five percent of the annual premium is borne by the central govt and 25% by the respective state governments^[16]. The program has covered 25 states and has received numerous accolades from international organizations like the World Bank and the UN.

However, a pertinent rise in hospitalization and medicine costs has compelled insurance companies to limit their policy benefits. Moreover, it is limited to inpatient treatment and lacks outpatient care coverage, which forms over 65% of the OOP expenditures of the country^[17]. Also, almost 40% of the BPL population is still not covered by the program and many remain unaware of the scheme^[17]. In an attempt to target the highlighted gaps, the govt. launched the Pradhan Mantri Jan Arogya Yojana (PMJAY) in 2018^[18].

Ayushman Bharat Yojana

Launched by the MOHFW, PMJAY or Ayushman Bharat program is committed to reduce the financial burden on the poor and vulnerable groups due to healthcare and ensure the nation's progress towards achieving Universal Health Coverage (UHC) and Sustainable development goal 3 (SDG 3)^[18]. It offers a benefit cover of Rs. 5 lakhs per family, per year to approximately 10.4 crores paltry, impoverished rural families, and categorized urban worker's families^[18]. The scheme provides cashless and paperless healthcare at all public and the impaneled private hospitals. In light of the omissions by the previous programs, the PMJAY ensures coverage for women, children, and the elderly^[18].

However, many private care providers are opting out of the scheme as the costs of healthcare provision are not financially viable for them and due to delay in payments by the government^[19].

The way forward

In the above sections, the health system issues of India have been discussed, and the two significant factors responsible have been briefed about. It is imperative to understand that while no country is free from these

issues, some have elite healthcare systems for instance, The Netherlands.

Highlights of the Dutch healthcare system

Catering to a population of over 16 million, The Netherlands spends 10.9% of its GDP on healthcare^[20]. The Netherlands is one of the few countries to spend more than 4000 Euros per person on healthcare. Five significant healthcare acts dictate the Dutch healthcare system which are: The Health insurance act, the Long term care act, the Social support act, the Public health act and the Youth act^[21]. The country has mandated purchasing health insurance with 99% of the population being covered by health insurance^[20].

Furthermore, the new Health insurance act in 2006 entitles all residents to a comprehensive health insurance package pioneered by the government. It finances the Social health insurance partly with coverage of consultations of General practitioners (GP), specialist and hospital care, medications, mental health care, Dental care up to 18yrs, and maternity care^[22]. In addition to the mandatory statutory insurance, around 84% of the population is also covered by specific voluntary insurance schemes such as Dental insurance, and preventive care^[22]. Thus health insurance plays a central part in the Dutch health system. The Dutch healthcare sector is thus largely financed by the government, and most of the revenue generated for the same is through taxation.

Over 39% of the revenue generated is via taxation. The Ministry of Finance is responsible for the governance of tax laws in the country, and the "Belastingdienst" is the department taking care of it^[23]. The Dutch have a progressive box taxation system with individuals of all income categories are liable to pay taxes^[23]. Further, foreign income, income from a pension, income from business are also liable for taxation. Also, the government has specified penalties for a breach in the code as well. The tax office can issue a penalty up to 4920 Euros in case of a delay in filing a tax return or not filing at all^[24]. Also, any hidden or undeclared income when discovered by the Belastingdienst is liable to a fine up to 300%^[23]. Moreover, the government generates a decent revenue from taxation, and the allocates the same to the aid of healthcare in the country via a defined system of health insurance. The Netherlands has engineered a structured

taxation system which certainly can be the goal to achieve for a country like India.

Potential for the Indian context

While some implementation strategies discussed in the previous sections can be practically installed, it is necessary to keep in mind that the setting in India is contrasting to that of in Europe. Although the regions differ in demography, culture, and economy, some strategies from the Netherlands can be implemented in India with a bit of tailoring as per the context. For instance, the country can increase healthcare spending by prioritizing the sector. One way to increase revenue for healthcare is by strengthening the system of taxation. Considering the insignificant proportion of taxpayers in the country, significant reforms need to be instituted in the taxation system. Like the Dutch system, guidelines can be put in place to organize the rules of income tax in India. For instance, reviewing the current eligibility criteria for income tax, which means including those earning an income from agriculture and other informal sectors as well in the taxpaying category, may be considered. Another strategy could be installing a system of penalties for tax evasion.

Another reason for the elite level of healthcare in the Netherlands is the coverage of health insurance. To start with, the Indian government can reinforce public insurance and encourage private insurance companies to come up. Correspondingly, specific rules need to be strategically implemented, for instance, mandating health insurance. Furthermore, the country needs to develop schemes and programs for special populations, such as; children, and older adults.

Conclusion

With a large population and diversities within, health system functioning in India is a labyrinthine affair. In addition, the sector is not economically well provided, and it reflects upon the state of healthcare affordability in the country. This leads to the two cardinal elements discussed in the paper that are primarily culpable for the state of healthcare in India which are: sparse number of taxpayers and insufficient health insurance coverage. As discussed in the previous sections, the country harbors a massive proportion of tax evaders, thus not generating the potential revenue and eventually cramping up the

country's finances. As a result, catastrophic health expenses drive a large number of the population into poverty, which is one of the ramifications of inadequate insurance coverage, and the lack of awareness about its importance. However, strategies from developed nations such as the Netherlands may be installed in a country like India.

The nation has tackled the issues mentioned in the previous paragraphs long ago by a stringent organization of their health systems and installing a penalty system for any breach in the rules. Some ideas taken from these European nations can surely be implemented in the Indian scenario with a required bit of modification. Some initiatives might have been taken in this regard; however, with changing paradigms in the country, it remains to be seen how these ideas unfold and perpetuate.

Conflicts of Interest- None

Source of Funding- Not applicable

Ethical Clearance- Not applicable

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Immediate Effect of Playing Smart Phone Action Videogames on Audiovisual Reaction Time

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Abstract

Background: Smart phone gaming has become an integral part of the lives of college students. Studies have given controversial results of playing action video games. Some studies concluded that action video game playing improves visual and attentional skills. On the contrary, other studies have proved that such gaming activities are more likely to cause frustrating experience resulting in mental stress. Medical undergraduate students have more academic pressure and longer educational years than other college students. Computer and mobile games provide a way for medical undergraduate students to relax. Hence this study was undertaken to estimate the immediate effect of playing action videogames on audiovisual reaction time in medical students.

Method: Undergraduate students (n=100) in the age group of 18 to 23 years were included in the study. After institutional ethical committee approval students were voluntarily included in study based on inclusion and exclusion criteria. Audiovisual reaction time was estimated in the participants by audiovisual reaction time apparatus.

Result: Audiovisual reaction time was found to be significantly increased ($p < 0.001$) in students immediately after playing action video games.

Conclusion: Thus, this study concludes that audiovisual reaction time is prolonged immediately after playing action video games on smart phone in students.

Keywords: Action Video Games, Visual Reaction Time, Auditory reaction time, Attentional Skills

Introduction

The number of smartphone users in India has increased to 239 million by the end of 2015 and tremendous increase is expected about 702 million by 2020. [1]

Smart phone is a multitasking gadget which not only ensures communication, but also ensures entertainment in the form of games and music. [2] Mobile games are

video games played by single-player or multiple players. They are available online via a mobile device, and are popular when downloaded for free. [3]

In 21st century although various reports have documented the beneficial effects of playing video games they did not specify the types of mobile game used for the study. [4] Now a day there are various types available such as brain games, action games, and adventure games. Depending on the type of game, there could be a difference in responsiveness. [4,5]

Few studies have stated that 'action' video games promote the perceptual and attentional abilities. [5] On the contrary few studies have proved that some games cause frustrating experience and trigger the highest

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urge to continue playing. Furthermore, smartphone gaming content and patterns of use (i.e., frequency of smartphone use on weekdays and weekend days) is also related to problematic smartphone use. [6]

Students pursuing professional course in medical college have more academic pressure and longer educational years than other college students. [7,8] Along with academics they have to face daily stressors of life, family matters and patient-related workload in both undergraduate and postgraduate students in both males and females. [7] It has been observed that in females pursuing professional course perceived stress score was directly correlated with menstrual problems. [9] Computer and mobile games provide a way for medical undergraduate students to relax. [10] The video game time of medical students and the factors influencing this time may differ from those influencing students of other majors. It has been observed that students play the games during day time whenever they get time, even in between the two consecutive lectures. The concept of game disorder has progressed and is now officially included in the ICD-11. (International Classification of Diseases-11) Gaming disorder is a pattern of gaming behavior (“digital-gaming” or “video-gaming”) characterized by impaired control over gaming. [11]

Reaction time is a reliable indicator to assess the processing capability of CNS and sensory motor performance in response to an external stimulus. [12] Its determination is one of the important methods to study a person’s central information processing speed and coordinated peripheral movement response.

Most of the studies [5,6] done to assess effect of playing mobile games have not documented immediate effect of playing the game on audiovisual reaction time. Thus the present study was planned to study immediate effect of playing action games (on smart phones) on audio-visual reaction time in students pursuing professional course.

Material Method

This was a cross sectional observational study and was carried out in the Physiology department, in a local medical college. After ethical committee approval the volunteers were briefed about the study protocol and a written informed consent was obtained from them.

Undergraduate students (n=100) in the age group of 18 to 23 years were included in the study. They were divided into Control group (n=50) and study group subjects (n=50). The auditory and visual reaction time was recorded before and after 10 minutes of playing the action game on smart phone in one sitting on the same day in study group subjects. Control group were asked to sit quietly in room and readings were taken after 10 minutes. The readings were taken between 11 a.m. and 12 noon in a quiet secluded room. They were asked to take light breakfast in morning. It was ensured that they did not have caffeine before coming for the experiment as it has a direct effect on the reaction time.

Volunteers in the age group of 18-23 years were included in this study. A written questionnaire which included duration in years and number of hours per day was filled by the students. Students playing smartphone gaming for 2-3 years and a minimum time of 3-4 hours per day were included in the study. (self-reported data)

On the other hand, volunteers who were non-alcoholics and non-smokers, those who were suffering from color blindness, acute or chronic cardiorespiratory illness, having any kind of hearing disabilities or with any physical deformity and taking any medication affecting the cognitive performance were excluded from this study.

Audio-visual reaction time:

Reaction time was recorded by using the Reaction Time Apparatus by Anand Agency Pune. The apparatus consisted of a source of stimulus, response key and the time recording device. The response was given by the test subject by pressing a key with his index finger. Time taken by the test subject to give a response was displayed with an accuracy of 1 millisecond and was recorded as his reaction time. [12]

The stimuli were in the form of a visual stimulus (green light or a red light) or an auditory stimulus (tone or click). The volunteer was informed about the type of stimulus that was produced in front of him/her, beforehand. The volunteer responded to the stimulus, as soon as he/she saw or heard it, by pressing both the buttons, placed on the either side of the surface of the apparatus. In this process, a reading was recorded and shown on the screen. This was the reaction time of the

individual, which was noted down. Three readings of each stimuli were taken, before and after playing the action game and their respective fastest reaction time for each stimuli was recorded. The fore period was also changed randomly before selecting the type of stimulus, which was totally unknown to the volunteer. [13,14]

Hence, this study was helpful in knowing whether audiovisual reaction time was affected immediately after playing action games on smart phone.

Statistical analysis- Data was represented in the form of mean + SD. Comparison was done in control and

study group subjects by unpaired 't' test. Comparison of auditory and visual reaction time values before and after playing action game on smart phone by students in study group subjects was done by paired 't' test.

Results

Mean age of students was 19.6 ± 0.2 years. Control group and study group subjects were involved for the duration of 2.12 ± 0.43 hours and 3 ± 0.64 hours daily in smart phone gaming. Statistically significant increase in auditory and visual reaction time was observed in study group subjects before and immediately after playing action games on smart phones.

Table no 1: Comparison of audio visual reaction time in control group subjects

Parameter	Control group (n=50) Before and after sitting quietly		p value
	Before	After	
High pitched sound (mean \pm SD) ms	0.198 \pm 0.070	0.201 \pm 0.075	>0.05
Low pitched sound (mean \pm SD) ms	0.187 \pm 0.042	0.185 \pm 0.052	>0.05
Red light (mean \pm SD) ms	0.256 \pm 0.052	0.254 \pm 0.063	>0.05
Green light (mean \pm SD) ms	0.234 \pm 0.174	0.236 \pm 0.183	>0.05

p>0.05 statistically not significant

Table no 2: Comparison of auditory reaction time in study group subjects before and after playing action games

Parameter	Study group (n=50) playing action game		p value
	Before	After	
High pitched sound (mean \pm SD) ms	0.201 \pm 0.075	0.292 \pm 0.116	< 0.001*
Low pitched sound (mean \pm SD) ms	0.185 \pm 0.052	0.300 \pm 0.183	< 0.001*

p< 0.001* statistically highly significant

Table no 3: Comparison of visual reaction time in study group subjects before and after playing action games

Parameter	Study group (n=50) playing action game		p value
	Before	After	
Red light (mean ± SD) ms	0.254±0.063	0.292±0.116	< 0.001*
Green light (mean ± SD) ms	0.236±0.183	0.300±0.183	< 0.001*

p< 0.001* statistically highly significant

Discussion

The present study was aimed to observe immediate effect of playing action video games on audio-visual reaction time in undergraduate medical students.

As observed in Table-1 statistically significant difference was not observed in control group subjects before and after sitting quietly in room for 10 minutes. Table no 2 and Table no 3 shows statistically significant increase in auditory and visual reaction time in study group subjects before and after playing action games. This might be due to decreased concentration and alertness. It has been observed that mental fatigue occurs after playing action games.^[15] (Reed and Antonova, 2007).

Study done by Sushil Chandra et al ^[16] observed that training in action video games improved reaction time, processing speed and reduced stress level. Also progressive attainment of skills i.e. hand eye co-ordination in psychomotor domain was observed in the study. This study has highlighted positive effects of playing action video games such as modifying visual selective attention, leading to improvement in basic cognitive skills.

The results of present study are not consistent with the earlier findings. ^[16] This might be due to the reason that earlier studies have not recorded the reaction time immediately after playing action video games on smart phone. They have studied overall effect and have compared with the control group who did not play

similar type of games.

An increase in reaction time indicates a reduced sensorimotor performance and could be due to decreased information processing ability of the central nervous system. It might be due to reduced performance in the speed and accuracy task due to diverted mind. ^[14]

King et al^[17] identified that graphics and presentation causes motivation to play videogames leading to digital fatigue. Also number of actions per unit of time to achieve the greatest reward while playing action video games make the students engrossed for the time being.

The focus of the volunteers is always on relatively fast tasks requiring decisions between just two alternatives. All these causes digital fatigue leading to increased reaction time. It has been observed that while playing games on smart phone volunteers feel anxious about their performance.^[18]

In a professional college if students play such type of games in between free time during the lectures their attention towards teaching will be affected eventually losing the interest in studies. So it's of utmost importance to make students aware about the side effects and encouraging them to play such games for fun during leisure time beyond teaching hours.

Conclusion: Increased reaction time immediately after playing action video game indicates decreased responsiveness of the students. Full concentration for a particular time period on the game ultimately decreased

alertness due to digital fatigue.

Conflict of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Type: Original Research

Evaluation of Serum Uric Acid Levels in Psoriasis Vulgaris

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Abstract

Aims and Objectives: To estimate and compare the Serum Uric Acid levels in Psoriasis Vulgaris patients and healthy controls and to find out any association between the Serum Uric Acid levels and severity of the psoriasis vulgaris.

Methodology: Forty patients with clinically diagnosed Psoriasis Vulgaris were taken and assessed for Serum Uric Acid levels. Forty age, sex and BMI matched controls were taken and findings of both cases and controls were compared.

Results: Out of 40 cases, the prevalence of hyperuricemia in Psoriasis Vulgaris patients in our study was 17.5% compared to 10% in controls. Increased SUA levels were associated with higher PASI score and higher BSA involvement. Psoriasis and PASI were found to be independent predictors of hyperuricemia.

Conclusion: Serum uric acid levels offer to be a valuable biomarker in the evaluation of Psoriasis Vulgaris and its management.

Keyword: chronic inflammation, hyperuricemia, psoriasis vulgaris, uric acid

Introduction

Psoriasis is chronic, non-contagious condition of the skin marked by chronic inflammation and hyper proliferation of skin cells leading to formation of erythematous, well defined plaques with silvery white dry loose scales all over the body, usually over extensor aspects. Psoriasis is associated with increased risk of cardiovascular disease¹ and Hyperuricemia itself is an independent factor for cardiovascular disease.² Psoriasis is also associated with higher risk of obesity and alcohol consumption which may further increase Uric Acid levels.³ Uric acid crystals are strong stimulators of innate immunity.⁴ Thus, hyperuricemia might not just be a consequence of hyper metabolism of purines but also may be a factor in perpetuating the disease. Hyperuricemia appears to be an independent risk factor for psoriatic

arthritis.⁵ Uric acid as a factor might be able to predict the disease activity as well as be useful in monitoring the disease. Thus, it may be an important biomarker in managing psoriasis as well as its complications such as psoriatic arthritis.

Materials and Method

Forty patients of either sex with clinically diagnosed Psoriasis Vulgaris attending the Out Patient department(OPD) at Maharishi Markandeshwar Institute of Medical Sciences and Research (MMDU),Mullana, Ambala (Haryana) were enrolled in the study. The control group comprised of Age, Sex and BMI matched 40 individuals attending the OPD. The participation was totally voluntary and a written, informed consent was taken in a language understandable to the patient.

Inclusion Criteria:

- a) Patients with clinically diagnosed psoriasis vulgaris.
- b) Patients of either sex of age 18 years or older.

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c) Patients willing to participate in study.

Exclusion Criteria:

a) Patients less than 18 years of age.

b) Pregnant and lactating females.

e) Patients taking any drugs known to affect SUA level, including diuretics, allopurinol, alcohol, losartan, estrogens, glucocorticoids, salicylates, levodopa, theophylline, pyrazinamide, ethambutol and cyclosporine.

d) Patients with history of gout, diabetes mellitus, chronic liver or renal diseases.

e) Patients who are on methotrexate or have taken methotrexate in the past 3 months.

A total of 80 patients attending the Dermatology OPD of either sex above the age of 18 years with clinically diagnosed Psoriasis vulgaris were enrolled in the study. Cases were clinically diagnosed psoriasis patients and selected after they met inclusion and exclusion criteria.

Controls were patients with other dermatological complaints, which do not have any proven association with derangements of serum uric acid levels and attendants of patients visiting the Hospital. Controls were age, sex and BMI matched before enrolment into the study.

A detailed medical history along with thorough dermatological and systemic examination was done. The severity of psoriasis vulgaris was assessed by

using PASI scale.

Blood samples were collected from cases and controls after an overnight fast, and Serum Uric acid were analysed by Uricase method/kit method (Transasia) as per manufacturers protocol, using Erba Manheim (EM 360) analyser. The results were interpreted as

Normal Serum uric acid level (in males) = 3.4-7.0 mg/dL

Normal Serum uric acid level (in females) = 2.4-5.7 mg/dL

Hyperuricemia (in males) = >7.0 mg/dL

Hyperuricemia (in females) = >5.7 mg/dL

After all the data was collected, it was tabulated and analysed using appropriate statistical tests/methods. The level of significance used was 0.05 for the corresponding degree of freedom. A P-value > 0.05 was not considered as statistically significant and a P-value < 0.05 was considered statistically significant with value < 0.001 as highly significant.

Results

This study included 80 individuals (40 psoriatic patients and 40 controls) with male to female ratio of 3.4:1 (31 males and 9 females in each group). The mean age among the cases was 41.45 years and the mean BMI was 25.73 kg/m². Descriptive characteristics of study population are reported in table 1. No statistical difference was observed between age of the patient and SUA levels. (p=0.9)

Table 1: Cases distribution according to Age and Gender

Age (In Years)	Males		Females		Total	Percentage(%)
	Number	Percentage	Number	Percentage		
18-30	8	25.81	2	22.22	10	25
31-40	6	19.35	4	44.44	10	25
41-50	12	38.71	1	11.11	13	32.5
51-60	5	16.13	2	22.22	7	17.5
TOTAL	31	100	9	100	40	100

Mean SUA level of the cases was higher (5.46 mg/dl) as compared to controls (4.64 mg/dl) p=0.011. Among males, mean SUA was 5.62±1.47 mg/dl in cases and 4.75±1.15 mg/dl in controls. Among females, mean SUA was 4.89±1.48 mg/dl in cases and 4.26±1.78 mg/dl in controls.

Table 2: Clinical characteristics of participants in the study

Clinical characteristics	Cases	Controls	P value
Age(years)	41.45±11.126	41.05	Matched
Sex (Male/Female)	31/9	31/9	Matched
BMI(kg/m ²)	25.73	25.55±1.96	Matched
Serum Uric Acid(mg/dl)	5.46±1.49	4.64±1.31	0.011

Table 3: Distribution of patients of Psoriasis according to individual parameters

Parameters	NO. OF INDIVIDUALS	PERCENTAGE	Mean SUA (mg/dl)	Standard deviation	P value
Males	31	77.5	5.62	1.47	0.012
Females	9	22.5	4.89	1.48	0.423
Joint Involvement yes	12	30	6.04	1.34	0.104
Joint Involvement no	28	70	5.21	1.50	
Nail involvement yes	15	37.5	5.4	1.40	0.85
Nail involvement no	25	62.5	5.49	1.56	
BSA 0-5	25	62.5	5.08	1.55	0.086
BSA 5-10	8	20	5.89	1.22	
BSA >10	7	17.5	6.34	1.12	
PASI 0-5	8	22	4.4	0.76	<0.001
PASI 5-10	23	57.5	5.19	1.38	
PASI >10	9	22.5	7.09	0.82	

Mean body surface area involvement was 4.79%. SUA of the patients showed an increasing trend as BSA increased but this difference was not found to be statistically significant ($p=0.086$). For severity assessment PASI score was calculated.

Mean PASI score was 6.95, higher SUA was observed in patients with severe PASI score. The

relation between PASI score and SUA level was found to be statistically highly significant. ($p<0.001$). In the present study, 30% of the patients had history of joint involvement. Patients with joint involvement had higher SUA but this difference was found to be statistically not significant ($p=0.104$).

Table 4: Multivariate linear regression for hyperuricemia

Model 1 : Predictors of Hyperuricemia among participants in the study(N=80)			
Characteristic	Beta	t value	Significance(p)
Age	0.020	0.191	0.85
Sex	0.119	1.057	0.29
BMI	0.194	1.718	0.09
Psoriasis	0.278	2.646	0.01
Model:2 Predictors of Hyperuricemia in Psoriasis patients(N=40)			
Age	0.094	0.773	0.445
Sex	0.126	1.024	0.313
BSA	0.198	1.248	0.220
PASI	0.353	2.282	0.021

Multivariate linear regression analysis was done which revealed that both Psoriasis ($p=0.01$) and PASI ($p=0.021$) were independent predictors of hyperuricemia.

Discussion

Psoriasis is one of the longest standing skin disease known to mankind. It is known to affect 2-3% of the population worldwide. It primarily involves skin and joints. Lately, it is being recognised as a multisystem inflammatory disorder due to the various co-morbidities associated with Psoriasis. Plaque Psoriasis (Psoriasis vulgaris) is the most common variant and presents as well defined erythematous, indurated, scaly plaques particularly over extensor aspects.

Psoriasis is a disease characterized by epidermal hyperplasia. This hyper-proliferation of keratinocytes requires increased rate of DNA formation. Consequently,

DNA degradation also occurs at much higher rate. This increased cell turnover leads to increased rate of purine formation and metabolism as purines are a fundamental part of DNA. Uric acid is an organic compound that is endogenously formed as a product of metabolic breakdown of purines. The increased degradation of purines may be reflected as higher levels of Serum Uric Acid in Psoriasis patients. Increased SUA levels may further be a risk factor for gout⁶, renal disease⁷, hypertension^{8,9} and cardiovascular diseases.²

In the present study, male patients had higher mean SUA (5.62 mg/dl) than male controls (4.76 mg/dl) and this difference was found to be statistically significant ($p=0.012$). This was in accordance with the study

conducted by Guiet al.¹⁰, Chand et al.¹¹ and Baumann et al.¹² In our study, female patients had higher mean SUA (4.89 mg/dl) as compared to females in the control group (4.26 mg/dl) and this was found to be statistically not significant. ($p=0.423$). This was in accordance with the study conducted by Chand et al.¹¹ and Baumann et al.¹² and they reported this difference to be statistically significant.

In our study, the SUA levels were observed to be higher among cases (mean SUA=5.46±1.49 mg/dl) as compared to controls (mean SUA=4.64±1.31). The difference between SUA levels of cases and controls was found to be statistically significant. ($p=0.011$) This was in accordance with the study conducted by Gisondiet al.¹³, Yilmaz et al.¹⁴, Khan et al.¹⁵, while contrasting results were reported by Agravatt et al.¹⁶ and Nicolae et al.¹⁷ The higher SUA levels among patients with Psoriasis can be explained by increased rate of purine metabolism, due to the rapid epidermal turnover, leading to accumulation of uric acid which is the end product of purine degradation.

Several studies have shown that hyperuricemia is an important risk factor for gout, renal disease (uric acid nephropathy, renal insufficiency etc.), hypertension and cardiovascular diseases. The increased hyperuricemia among psoriasis patients may increase the risk of many comorbidities in psoriasis patients. Various studies have reported increased prevalence of hyperuricemia among psoriasis patients. In 2015, Lai et al.¹⁸ conducted a study and found hyperuricemia in 17.17% of psoriasis patients as compared to 13.1 in controls. Similarly, Guiet al.¹⁰ found increased prevalence of hyperuricemia in psoriasis patients (31.6%) as compared to controls (17%). Our study has also reported increased hyperuricemia in psoriasis vulgaris patients (17.5% in cases and 10% in controls). The increased hyperuricemia among psoriasis patients may increase the risk of many comorbidities in psoriasis patients.

SUA levels have been known to be higher in various diseases affecting the joints. As psoriasis has been known to primarily involve skin and joints, it is expected that SUA levels may be higher in patients with joint involvement. Psoriatic arthritis is a seronegative inflammatory arthritis, which occurs in up to 40% of patients with moderate to severe psoriasis.¹⁹ Once

considered to be a mild disease, psoriatic arthritis is now considered to be a debilitating disease requiring targeted treatment with frequent monitoring and follow-up care.²⁰ Various studies conducted earlier have shown higher SUA levels in Psoriatic arthritis. In 2017, Collazo et al.²¹ reported higher SUA levels in psoriatic patients with joint manifestations but this was found to be statistically not significant. In our study also, higher SUA levels were present in patients with joint involvement but this difference was found to be statistically not significant. Thus, SUA levels can be a valuable tool in early diagnosis of psoriatic arthritis. Early intervention in such cases would prevent further complications.

Extent of body surface area involvement has been evaluated in some of the earlier studies to indicate presence of hyperuricemia. In 2011, Kwon et al.²² reported the relation between extent of BSA involvement and SUA level to be statistically highly significant. In 2017, Collazo et al.²¹ reported this relation to be statistically not significant. In our study, higher BSA involvement was associated with higher SUA level but this relation was found to be statistically not significant ($p=0.086$).

Increase in SUA levels in psoriasis patients has been attributed to the increased proliferation and rapid turnover of epidermal cells. To assess the impact of disease severity, PASI scale was used. Increased SUA levels were observed in patients with higher PASI score and this difference was found to be statistically highly significant ($p<0.001$). Our study shows higher the severity of psoriasis, higher are the SUA levels. Many of the earlier studies conducted by Kwon et al.²² ($p<0.05$) and Collazo et al.²¹ ($p<0.01$) have shown similar results. Multivariate linear regression model was also applied among Psoriasis patients which revealed that PASI score was an independent predictor of raised Serum Uric Acid levels. Similar results were observed in the studies by Kwon et al.²² and Gisondi et al.¹³ whereas contrasting results were reported by Gui et al.¹⁰. The raised SUA levels could be due to rapid epidermal turnover (with increased rate of purine metabolism). Hyperuricemia has been shown to be important risk factor for various other diseases such as renal disease (uric acid nephropathy, renal insufficiency etc.), hypertension and cardiovascular diseases⁽²³⁾ and may increase the risk of complications in Psoriasis patients.

Conclusion

Psoriasis is primarily a dermatological disease; it has been associated with many systemic abnormalities manifesting as comorbidities. Overall hyperuricemia was more prevalent in psoriatic patients. The SUA levels were significantly higher among Psoriasis patients as compared to the control group. Patients with higher SUA levels also had higher prevalence of joint involvement, higher extent of BSA involvement and higher severity (PASI) of Psoriasis. Psoriasis and PASI score being independent predictors of hyperuricemia show that Psoriatic patients are at increased risk of hyperuricemia and might develop subsequent complications (eg. Renal disease, Cardiovascular diseases etc.). Identifying hyperuricemic Psoriatic patients and treating them accordingly could help in applying various measures in order to prevent or manage the comorbidities and complications. Serum uric acid level offers to be a valuable biomarker in the assessment and monitoring of Psoriasis Vulgaris. It can be a useful prognostic indicator for various complications such as Psoriatic arthritis. Therefore, evaluation of SUA can be instrumental for a dermatologist in management of Psoriasis. This may help in intervening early and preventing complications and comorbidities associated with Psoriasis.

Limitations

As the present study was a cross sectional type, it cannot be ascertained how many patients with high SUA levels developed comorbidities in the future. Larger scale studies are required to ensure appropriate generalization of the findings of the study. Metabolic syndrome was not assessed in the study. It is unknown that drugs lowering SUA level will help in reducing the severity and complications of Psoriasis.

Conflict of Interest: NIL

Source of Funding: Self

Ethical approval and Informed consent: Obtained

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Community De-fluoridation - Experience in Kaiwara Village, Chikkaballapur District, Karnataka, India

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Abstract

Background and objective: Reverse osmosis technique is an adequate method for treating ground water for reducing the burden of abnormal levels of fluorides. The method protects the general population from diseases associated with high fluoride levels in the body. The objective of the present study was to assess the suitability and sustainability of reverse osmosis technology for community de-fluoridation of water used for cooking and drinking purposes in Kaiwara village, Karnataka.

Methodology: This interventional study was conducted between July 2012 and June 2014 at Kaiwara village, Karnataka using reverse osmosis technique for de-fluoridation of water used for drinking and cooking. Complete chemical analysis of water was done before intervention, and processed water supplying the village was tested every six months after intervention for about two years. The variation in chemical concentrations of various components were analysed.

Results: The mean baseline level of fluoride in untreated water was 2.075 mg/dl (above the safety limit), which dropped to 0.08 mg/dl at the end of first six months following the intervention, 0.042 mg/dl in 12 months, 0.1 mg/dl at 18 months and 0.01 mg/dl at 24 months after intervention, which were all below the safety limits for India in the treated water. The mean total dissolved solids in the water was 542.25 mg/dl in the untreated water, which dropped to zero after the first six months, remained at zero in the next six months, rose to 120 mg/dl at 18 months and then dropped to 70 mg/dl at 24 months in the treated water. The observed values were reduced significantly.

Discussion: The study concluded that it is possible to set up a community de-fluoridation plant using reverse osmosis technique at Kaiwara village, Karnataka which is economically sustainable and acceptable by local population.

Keywords: *Water pollution, Fluorides, Reverse osmosis, Community participation.*

Introduction

Water as we know, is one among the most important components for all forms of life and safe drinking water is the primary requirement for every human being. There is scarcity in the availability of portable water as natural sources or industrial wastes may contaminate water. One such contaminant is fluoride.¹

Fluorosis is one among the severe health problems faced by the public in India. Two-third of the states in India are fluoride endemic,² while approximately 25

million people are currently affected, and 66 million people are at risk of developing fluorosis.³

Over the last few years, domestic purification techniques came into use to minimise both inorganic and organic pollutants in water thereby maintaining the quality of water supplied to the urban society.⁴ There are various basic types of water purification systems that can be used alone or in combination, e.g., reverse osmosis, cation exchange softening, oxidation, filtration, activated carbon, disinfection, distillation, anion exchange etc.^{4,5}

Fluoride concentration present at low levels (< 0.5 ppm) in drinking water could cause lack of formation of dental enamel, dental caries and reduced bone mineralisation whereas high fluoride levels in drinking water could lead to adverse health effects ranging from mild dental fluorosis to crippling skeletal fluorosis, depending upon level of fluoride present and its duration of exposure.^{6,7}

Karnataka is among the fluoride endemic states in India.⁸ In Karnataka, districts endemic for fluorosis are Belgaum, Raichur, Bijapur, Gulbarga (districts in northern Karnataka) as well as Tumkur, Mandya, Mysore, Chitradurga, Shimogga, Chikmagalur, Bangalore-rural and Kolar (districts of southern and central Karnataka).⁹ Kaiwara village now comes under Chikkaballapur district but used to be part of Kolar district previously, forming a part of the fluoride belt bordering Andhra Pradesh. The weather conditions in Kaiwara village are like that of Chikkaballapur district.⁹

Results from some of the exploratory bore wells in Chikkaballapur region have recorded the concentration of fluoride to 2 ppm and above.¹⁰ As Kaiwara has no alternate source of water, it is dependent solely on ground water through bore wells for its water supply which have unacceptable levels of fluoride. The present study aimed to study the acceptability and sustainability of reverse osmosis technology for community defluoridation of water used for drinking and cooking purposes in Kaiwara village, Karnataka.¹⁰

Methodology

The present interventional study was conducted between July 2012 and June 2014 at Kaiwara village, Karnataka. The study was approved by the Ethical Review Board. Having gone through a number of studies on comparison of different methods for fluoride removal,¹¹ the Council for Scientific and Industrial Research Government¹² offered a 40,000 litres capacity reverse osmosis unit custom made for community defluoridation to pilot in the village, and report the feasibility of operating and sustaining such a technology within a village which can be replicated anywhere else in rural India.

Installation of the reverse osmosis plant was done in a plot granted by the Kaiwara Gram Panchayath that was

identified next to the main water tank of Kaiwara village which had a storage capacity of 100,000 litres of water. The Zilla Panchayath was approached for the electricity connection required for running the Reverse Osmosis plant (3Phase and 10KVA) from Kaiwara village. It was proposed that a sum of Rs 5/- would be collected for 25 litres of processed water from each household who were willing to purchase the processed water from January 1, 2012 for cooking and drinking purposes. 99.4% of heads of the families were willing to contribute and 89.8% of the heads of the family expressed acceptance for de-fluoridation of water in the village. The money collected by selling the processed water was used to run and maintain the R O plant. The cost of Rs 5/- per household was calculated considering Rs 3/- towards electricity and water charges for running of the R O Plant, maintenance charges for the R O Plant (filter replacement, pump repair etc) and salaries for the watch man, plant operator and electrician. Rs 2/- was further collected towards payment for the water distribution vehicle maintenance and petrol for the running of the vehicle as well as salary for the water distributor.

A road map of Kaiwara was prepared and 20 spots for water collection were identified in five areas of the village, which were less than 100 meters from the farthest house from the identified point (usual water collection points included). A vehicle with a 1000 litres tank fixed to it, which could be sealed from the top after filling with processed water and fitted with four taps, was used for the transport and distribution of the processed water to the collection point at a fixed time each day. Complete chemical analysis of untreated and processed water was made before intervention and processed water was tested every six months after intervention for about two years and the mean concentration levels before and after the intervention were compared.

Results

The opinion given for all four samples of water after complete chemical analysis (Table 1) was that the water was found to be unfit for potable purpose, as all the four samples showed excess of fluoride. The mean baseline levels of fluoride in untreated water were found to be 2.075 mg/dl and the mean total dissolved solids in untreated water was found to be 542.25 mg/dl.

Samples of the Feed, Product and Reject water obtained from the reverse osmosis plant and tested which will form a baseline data for our reverse osmosis process (refer Table 2).

The water sample after the intervention was submitted to Public Health Institute Bangalore for complete chemical analysis (Table 3) and was found to be useful for potable purposes. It was observed that the mean fluoride levels in the water which was 2.705 mg/dl in the untreated water, clearly above acceptable limits for India (0.5 mg/dl to 0.9 mg/dl) dropped to 0.08 mg/dl after the first six months, 0.042 mg/dl in the next six months, 0.1 mg/dl in the next six months and 0.01 mg/dl in the last six months which were all below the safety limits for India in the treated water. The fluoride levels

in the processed water were found to be significantly reduced.

Also, it was observed that the mean total dissolved solids in the untreated water which was 542.25 mg/dl in the untreated water which dropped to zero after the first six months, remained at zero in the next six months, rose to 120 mg/dl at 18 months and then dropped to 70 mg/dl at 24 months in the treated water. The total dissolved solid in processed water was significantly reduced.

The changes in the various parameters seen in the four reports are because at different times of the year, the conditions in bore wells supplying the main village tank also change, depending on the availability of water in the various bore wells.

Table 1: Complete chemical analysis of baseline water available at Kaiwara village

Component measured	Concentration in Chamundashwari Hill Tank	Concentration in Chikkaballapur Tank	Concentration in Vivekananda Tank	Concentration in Main Bore-well
Turbidity as (NTU)	0.0	0.0	0.0	0.0
PH value	7.7	8	7.6	7.4
Dissolved solids	538	481	539.5	611
Total hardness	320	260	292	344
Calcium	54.4	65.6	76.8	94.4
Sodium	55.38	64.71	57.95	74.26
Potassium	4.87	3.6	7.82	5.26
Sulphate	68.6	43.93	184.1	70.2
Alkalinity	250	292	212	260
Chlorides	106	52	74	130
Iron	0.09	0.09	0.08	0.01
Fluoride	1.72	2.08	2.26	2.24
Nitrate	2.56	9.90	5.8	5.5
Physical appearance	Clear	Clear	Clear	Clear

All components were measured in mg/dl

Table 2: Results of the test run-At 250 PSI pressure in the membrane filter

Type of water in RO unit	Total dissolved solids (ppm)	Flow rate (litres/minute)
Feed water	270	-
Product water	10	96
Reject water	1100	24

Table 3: Complete chemical analysis of processed water done every six months from July 2012 to June 2013

Sl. No	Component measured	Mean concentration (July 2012)	Mean concentration (December 2012)	Mean concentration (January 2013)	Mean concentration (June 2013)
1	Turbidity as (NTU)	0.0	0.0	0.0	0.0
2	PH value	6.8	7.8	6.30	7.40
3	Dissolved solids	---	---	120	70
4	Total hardness	76	36.0	58	10
5	Calcium	8.0	1.6	14.82	4.8
6	Sodium	7.2	---	17	---
7	Potassium	0.3	---	0.30	---
8	Sulphate	0.343	2.38	10	0.01
9	Alkalinity	22	8.0	60	48
10	Chlorides	22	22.0	17.72	10.70
11	Iron	.022	Not detected	0.06	0.01
12	Fluoride	.024	0.08	0.10	0.01
13	Nitrate	0.015	1.29	1.20	0.60
14	Physical appearance	Clear	Clear	Clear	Clear
All components were measured in mg/dl					

Discussion

Fluoride is one of the normal constituents in groundwater in this region. The concentration of fluoride is variable, and it depends on the source of water. Provision of safe drinking water with optimal fluoride levels is the solution to protect against diseases associated with abnormal fluoride content in water used for drinking and cooking. In this study, reverse osmosis technology was applied for community de-fluoridation of water in Kaiwara village, Karnataka.

In this study, it was also observed that the mean fluoride levels in the water which was 2.705 mg/dl in the untreated water which is clearly above acceptable limits for India (0.5 mg/dl to 0.9 mg/dl) dropped to 0.08 after the first 6 months, 0.042 mg/dl in the next six months, 0.1 mg/dl in the next six months and 0.01 in the last six month which are all below the safety limits for India in the treated water. This reduction in fluoride levels in water was found to be significant. This is in accordance with the study conducted by Prabhakar et. al.¹³ in which there was statistical significance in the reduction of fluoride levels by reverse osmosis technique.

In the present study, it was observed that the mean total dissolved solids in the water which was 542.25 mg/dl in the untreated water was dropped to zero after the six months, zero in the next six months, 120 mg/dl in the next six months and then 70 mg/dl in the last six months in the treated water. This reduction in total dissolved solid in water was found to be significant. This is in accordance with the study conducted by Do-Hyung Kim et.al.¹⁴ where there was reduction in the concentration of total dissolved salts by reverse osmosis technique which was significant.

From the current study, we concluded that it is possible to set up, operate and sustain a community de-fluoridation plant using reverse osmosis technology. The economic feasibility of using a technology like reverse osmosis for community defluoridation has been proved through the reverse osmosis technique-based intervention in Kaiwara village. This has been a self-sustaining and effective model for community de-fluoridation of water used for drinking and cooking purposes in Kaiwara village. The intervention has been self-sustaining for the past four years. This has been confirmed by the fact that there are already three reverse

osmosis plants in Kaiwara village and five other reverse osmosis plants in the surrounding villages following our model today.

Disclaimer: Not applicable.

Funding: MS Ramaiah Medical College, Bangalore, Karnataka

Conflicts of Interest: Nil

Ethical Clearance: Taken from Institutional Ethics Committee (MS Ramaiah Medical College, Bangalore, Karnataka)

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Effect of 810nm Diode Laser on Post-operative Pain Adjunct to Periodontal Flap Surgery

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Abstract

Introduction: Surgical lasers have been used in periodontal therapy. The anti-pain mechanism of low-level laser is not yet clear however, numerous studies have pointed out the physiological changes from light interference with various cells as the cause. Low-level laser can also modify the inflammatory process in a dose-related mechanism; and thus, it can reduce the inflammatory pain.²

Methodology: A sample of 10 systemically healthy subjects aged 30-60 years diagnosed with chronic periodontitis having a probing pocket depth ≥ 5 mm and clinical attachment loss ≥ 4 mm bilaterally in the region of the maxillary first premolar, second premolar and first molar were recruited from the out-patient, Department of Periodontics, A.B.Shetty Memorial Institute of Dental Sciences. The subjects were blinded as to which surgical site received the laser therapy following conventional periodontal flap surgery (Test Group). The subjects were recalled one week after scaling and root planing for the periodontal flap surgery. At the baseline visit, the contralateral surgical sites were randomly assigned to the control group or the test groups using a coin-flip.

In the test group, following the removal of soft deposits through scaling and root planing, the laser probe of 0.8W CW diode was used in a light contact, sweeping mode to cover the entire inner surface of the flap. Ablation was carried out from base of the flap to its coronal portion. **Results-**Median pain score did not differ significantly between the test and the control at 0 day, 1day, 2day and 5 day ($P > 0.05$), day7 ($P = 0.087$). Friedman test showed overall there was significant difference in pain score from 0 day to day7 test. Pain score differs significantly from day 0 to day7 ($P < 0.05$), day1 to day7 ($P < 0.05$), day2 to day7 ($P < 0.05$) except day5 to day7 ($P > 0.05$) within test group.

Conclusion-Lasers currently have a variety of uses in dentistry, although low-level lasers have been found beneficial in reducing the pain response after periodontal surgery in present study, but studies with larger sample are required to see significant association.

Key words- Diode laser, periodontal flap, pain response

Introduction

Periodontal surgery is a plastic surgical procedure designed to restore and regenerate normal form and function to lost and damaged periodontal structures.

Generally, surgery is indicated when the periodontal pocket persists even after the non-surgical procedures of Phase I treatment. The purpose of surgical pocket therapy is to eliminate the pathological changes in the pocket walls in order to create a stable, easily maintainable state

and if possible, to promote periodontal regeneration.

Surgical lasers have been used in periodontal therapy. Based on the type of the laser, power setting and wavelength, it can be used to excise the epithelium of the periodontal pocket during scaling and root planing and periodontal surgery, to eliminate calculus, granulation tissue and bone during resective and regenerative surgery, in the management of post-operative pain, enhanced coagulation and as a bactericidal agent.¹

Pain control following any surgical procedure is an essential part of periodontal treatment. This pain could be due to tissue trauma and the release of inflammatory mediators, which reaches its highest following the cessation of local anesthesia. Low-level Laser Therapy has been suggested as a pain-control protocol. The anti-pain mechanism of low-level laser is not yet clear, however, numerous studies have pointed out the physiological changes from light interference with various cells as the cause. The offered mechanisms include: stability of the lipid double membrane and its proteins, the enhancement of revival system and the increase in ATP production. Low-level laser can also modify the inflammatory process in a dose-related mechanism; and thus it can reduce the inflammatory pain.²

Hence, a study was planned to assess the postoperative pain and healing following conventional periodontal surgery without the use of a diode laser and comparing it with the use of an 810nm diode laser adjunct to periodontal flap surgery for the treatment of chronic periodontitis.

Material and Method

The study was a randomized, single masked split-mouth study. Ethical clearance was obtained from the institution ethics committee. A sample of 10 systemically healthy subjects aged 30-60 years diagnosed with chronic periodontitis having a probing pocket depth ≥ 5 mm and clinical attachment loss ≥ 4 mm bilaterally in the region of the maxillary first premolar, second premolar and first molar were recruited from the out-patient, Department of Periodontics, A.B.Shetty Memorial Institute of Dental Sciences. Subjects were excluded if they were smokers, were pregnant or gave history of long term steroidal and/or antimicrobial therapy.

One operator was enrolled to treat all subjects. The subjects were blinded as to which surgical site received the laser therapy following conventional periodontal flap surgery (Test Group). Clinical parameters such as clinical attachment loss, pocket depth, bleeding on probing, plaque index and gingival index were recorded at baseline followed by oral prophylaxis.

The subjects were recalled after one week to undergo subgingival scaling and root planing. Oral hygiene

instructions were reinforced after each appointment.

The subjects were recalled one week after scaling and root planing for the periodontal flap surgery. At the baseline visit, the contralateral surgical sites were randomly assigned to the control group or the test groups using a coin-flip.

In the test group, following the removal of soft deposits through scaling and root planing, the laser probe of 0.8W CW diode was used in a light contact, sweeping mode to cover the entire inner surface of the flap. Ablation was carried out from base of the flap to its coronal portion. Care was taken to avoid any laser contact to the root surface or the alveolar bone by placing a periosteal retractor between the hard and soft tissue. Ablation debris on the fiber was cleaned using damp, sterile gauze. Each flap was treated for 30 seconds amounting to possibly 1 minute per tooth. The control group received only the conventional periodontal surgery and a sham application of the diode. The surgical procedures were carried out one week apart. The periodontal flap was sutured with an interrupted suture using 3-0 black silk suture in all patients. Surgeries performed on all patients were virtually identical. All procedures were completed within a 1-hour time frame.^{1,3,4}

Oral hygiene instructions were reinforced and each subject was prescribed the use of a 0.2% Chlorhexidine mouthwash twice daily and Dolo 650 (650mg Paracetamol) as required (8 hourly and not more than 3 times/day) for the management of pain following each surgical procedure.

The post-operative tissue oedema seen in both the groups was assessed clinically after one week. Post-operative pain and discomfort was assessed using both, the visual analog case on Day 0, Day 3, Day 5 and Day 7, and, the number and frequency of painkillers taken post-operatively.¹

Results

The 10 subjects sample comprised of 5 females and 5 males in the age range of 42-57 years. Descriptive statistics such as median, interquartile range were calculated. Mann Whitney test was used to compare the scores between the groups. Friedman and Wilcoxon

Sign Rank Test was used to compare the scores within the groups. $P < 0.05$ is considered to be statistically significant. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp was used for statistical analysis.

Table 1: Pain score between test and control- Mann Whitney test

		Median	Interquartile Range [Q1, Q3]	P
Day0 Pain Score	pain response test	4.00	2.75,5.25	0.669
	pain response control	4.00	3.00,5.50	
Day1 Pain Score	pain response test	2.00	1.75,3.50	0.312
	pain response control	3.00	2.00,4.50	
Day2 Pain Score	pain response test	1.50	1.00,2.00	0.266
	pain response control	2.50	1.00,3.00	
Day5 Pain Score	pain response test	0.00	0.00,1.00	0.259
	pain response control	1.00	0.00,1.00	
Day7 Pain Score	pain response test	0.00	0.00,0.00	0.087
	pain response control	0.00	0.00,1.00	

Median pain score did not differ significantly between the test and the control at 0 day, 1day , 2day and 5 day ($P > 0.05$) ,day7 ($P = 0.087$)

Table 2 Median pain scores (Interquartile range) within the test group

	N	Median	Interquartile Range [Q1, Q3]
Day0 Pain Score	10	4.00	2.75,5.25
Day1 Pain Score	10	2.00	1.75,3.50
Day2 Pain Score	10	1.50	1.00,2.00
Day5 Pain Score	10	.00	0.00,1.00
Day7 Pain Score	10	.00	0.00,0.00

Friedman test- chi square=37.665 , $P < 0.001$ sig

Friedman test showed overall there was significant difference in pain score from 0 day to day7, but to find which

group differs significantly we use wilcoxon sign rank test

Table 3 Median pain scores (Interquartile range) within the control group

	N	Median	Interquartile Range [Q1, Q3]
Day0 Pain Score	10	4.00	3,5.50
Day1 Pain Score	10	3.00	2,4.50
Day2 Pain Score	10	2.50	1,3.00
Day5 Pain Score	10	1.00	0,1.00
Day7 Pain Score	10	0.00	0,1.00

Friedman test- chi square=37.871 P <0.001 sig

Table 4 Wilcoxon Signed Ranks Test within control group

	Day1 - Day0 Pain Score	Day2 - Day0 Pain Score	Day5 - Day0 Pain Score	Day7 - Day0 Pain Score	Day2 - Day1 Pain Score	Day5 - Day1 Pain Score	Day7 - Day1 Pain Score	Day5 - Day2 Pain Score	Day7 - Day2 Pain Score	Day7 - Day5 Pain Score
P	0.015	0.007	0.005	0.005	0.008	0.004	0.004	0.006	0.004	0.046

Pain score differs significantly from day 0 to day7 (P<0.05), day1 to day7 (P<0.05), day2 to day7 (P<0.05) and day5 to day7 (P>0.05) within control group

Table 5 Wilcoxon Signed Ranks Test- within test group

	Day1 - Day0 Painkillers	Day2 - Day0 Painkillers	Day5 - Day0 Painkillers	Day7 - Day0 Painkillers	Day2 - Day1 Painkillers	Day5 - Day1 Painkillers	Day7 - Day1 Painkillers	Day5 - Day2 Painkillers	Day7 - Day2 Painkillers	Day7 - Day5 Painkillers
P	.480	.059	.006	.004	.102	.017	.011	.023	.014	.317

Median pain killers used did not differ significantly between 0 day to day1, day0 to day2, day1 to day2 and day 5 to day7 (P>0.05). It differed significantly from day0 to day5, day 0 to day7, day1 to day5, day1 to day7, day2 to day5 and day2 to day7 (P<0.05) within the test group.

Discussion

This study found that diode laser use did not lead to postoperative complications or to impair tissue response, indicating that this type of laser has no detrimental effects when used in conjunction with periodontal flap surgery. Also, this study found that the postoperative pain and tissue oedema were reduced with the use of the diode laser. As the optimal dosage and treatment schedule has not been determined, it is difficult to evaluate the efficiency of LLLT. As a result, studies have encountered a wide range of clinical findings attributable to the differences in experimental and assessment methods and irradiation conditions.^{5,6,7,8}

Despite the proposed benefit of LLLT, there are very few clinical studies using LLLT in gingival surgery, which makes comparing the results of the current study with previous reports difficult. Human randomized controlled clinical studies that analyzed periodontal healing response using LLLT are available.

The pain scales used in this study are subjective and highly dependent on individual experience. However, the patient served as both the control and the test. Patients were unaware of which site actually received laser treatment to reduce the 'placebo effect of laser treatment'. The subjective measure of the pain using the scale found differences between the control sites and the test sites. However the differences in pain and the number of painkillers taken did not show a statistically significant difference.

The mechanism of LLLT involves photoreceptors in the electron transport chain within the membrane of cell mitochondria. Absorption of light creates a short-term activation of respiratory chain components, promoting ATP production and activation of nucleic acid synthesis.⁹

LLLT has an additional effect on fibroblasts by promoting proliferation and increasing cell numbers, secretion of growth factors, and differentiation of fibroblasts into myofibroblasts. During wound healing the inflammatory response and synthesis of specific extracellular matrix molecules by fibroblasts; angiogenesis, reepithelialization and remodeling are regulated by growth factors including transforming growth factor-beta1 (TGF- β 1) and basic fibroblast growth factor (bFGF). TGF- β 1 plays an important role

in wound healing by stimulating fibroblast proliferation, increasing the synthesis of extracellular matrix molecules and inhibitors of matrix metalloproteinases (MMPs), and inhibiting MMP synthesis. bFGF is a potent mitogen and chemo attractant for fibroblasts and endothelial cells and induces a predominantly angiogenic response in the wound and activates the neutral proteases in both epithelial cells and fibroblasts.^{10,11}

Conclusion

Lasers currently have a variety of uses in dentistry, and some low-level lasers have been found beneficial in in vitro studies. However, clinical outcomes in vivo application of low-level lasers is still unclear, although this study found postoperative pain and tissue oedema were reduced with the use of the diode laser. To assess whether lasers provide additional benefits to periodontal treatment, studies with larger sample size are needed to be done.

Conflict of Interest -There are no conflicts of interest

Source of Funding-self

Ethical Approval --obtained

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A Cross Sectional Study on Middle Finger Tip Pinch, Ring Finger Tip Pinch, Little Finger Tip Pinch Strengths : The Correlations with Anthropometric Variables in North Indian Population

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Abstract

Introduction: Pinch strength in addition to handgrip strength is considered an important factor in the assessment of proper hand muscle function. Various parameters like nutritional status, physical activities and muscle pathologies can affect the overall gripping capabilities of the fingers. The unique abilities of opposition in human hand is because of the distinct articular surfaces in the miniature bones and intrinsic muscles of the hand. Due to fine neuromuscular coordination and sensory perception in the digits, firm grasping abilities and in the hand pinches have developed. These grasps can be very useful for sensory and motor capabilities of the hand specially in sports like cricket, baseball and volleyball.

AIM: To generate data for middle finger tip pinch, ring finger tip pinch, little finger tip pinch strengths and to evaluate their correlations with other anthropometric indices.

Materials and Methods: Four hundred and fifty healthy young adult individuals were selected for the study. A pinch gauze was used to measure pinch grip strengths in both the sides. Pearson's correlation test and independent t-tests were used. SPSS Version 20 was used for statistical analysis.

Result: Mean age of the population was 22 years and all the subjects were males. Pinch grip strength in all the pinches were found to be greater in dominant side than non dominant side ($p < 0.001$). There was significant association between middle finger tip pinch and anthropometric indices. No statistically significant correlation of little finger tip pinch with waist circumference, waist to hip ratio and BMI was observed.

Conclusion: The analysis provides normative data for pinch grip strengths and their correlation with other anthropometric indices in adult North Indian population.

Keywords : Pinch grip strength, BMI, Indian population

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Introduction

Sports activities need high level of forearm and hand muscle strength¹. Tip pinch is stated to be a positioning pinch useful in daily life activities needed for fine motor skills instead of hand grip and pinch strengths². Dental surgeons are at an increased risk of musculoskeletal

disorders due to repetitive hand function, pinch force and sustained hand postures. Various factors can affect pinch strength like hand dominance, height, body weight, age, finger strength etc³. Salam FA conducted a study to evaluate the grip and pinch strengths of these professionals⁴.

In the field of dentistry, the management of patient by dental surgeons is done in an inflexible work posture because of which musculoskeletal disorders tend to develop quiet early in their carrier. During periodontal scaling, high pinch force is applied; development of muscular fatigue is quiet common and this affects the pinch strengths. Pinch grip hence becomes an important index in hand therapy evaluations. Pinch force is also affected by general weakness, nutritional status, physical activities, muscle disabilities, decrease of cognitive measures .

Studies concerning pinch strength of middle finger tip pinch, ring finger tip pinch and little finger tip pinch are lacking. It is stated that the muscle of obese individual have fatty infiltration and alteration in the distribution of type I and type II muscle fibres which also enhances muscle strength and endurance⁵. Waist to height ratio is an useful parameter for discriminating hypertension, diabetes and dyslipidemia in both the genders. It is found to be more precise measure of body fat distribution⁶. Waist- hip ratio (WHR) above 0.9 for males and 0.85 for females or a BMI above 30 is a possible indicator of obesity and other more serious health conditions according to World Health Organization (WHO)⁷.

In fast pitch of baseball the index and middle finger tips are used in the perpendicular seam of baseball, the thumb lies underneath the baseball resting on the smooth leather⁸. That is why the role of pinch strength in such sports is important.

Daily life activities like insertion and removal of a key or the Automated Teller Machine (ATM) Card, operating clothes with zipper, insertion or removal of a plug, eatables requiring the insertion of prongs of a fork, operating a remote control or holding a pen all need good pinch strength⁹.

Considering the relevance of these parameters in sports and day to day life activities the study was conducted to establish the correlation of anthropometric

indices.

Present study will be helpful to establish the relationship between BMI and other anthropometric indices on pinch grip strengths and role of physical activities and fitness on overall health of medical students for their better performance in academics and sports.

Material and Method

Participants:

This cross sectional study was conducted on four hundred fifty young healthy adult North Indian males, in the age group of 18-26 years. The participants were medical students of MMIMSR, MMDU , Mullana, Ambala, Haryana. The study was conducted from Mar 2017 to Feb 2019 .

The subjects with any neuromuscular and musculoskeletal impairment of upper limb or any cardio-systemic illness after taking adequate history were excluded from the study. Prior informed consent were taken from the participants. The study was approved (Project No. IEC-1132) by Institute Research And Ethics Committee.

Measurements:

A pinch gauze (Saehan Corp. Masan, Korea, ModelNo.SH5005) was used to assess middle finger tip pinch, ring finger tip pinch & little finger tip pinch on both dominant and non dominant sides. Subjects were asked to sit with shoulders adducted, elbow flexed to 90 ° forearm in neutral position, wrist between 0 ° to 30 ° of extension and 0 ° to 15 ° ulnar deviation. Pinch measurements were performed with wrist, forearm, elbow, shoulders in neutral position. Height was measured in metres using stadiometer. Heels, buttocks, shoulders were in contiguity with flat rigid surface or wall during the assessment and head was in easeful, upright position.

Weight of subjects were measured in kilograms with help of electronic weighing scale (unicare). Subject was asked to stand freely, barefooted on the weighing scale with equally distributed weight with empty pockets.

Subjects were directed to nip the pinch gauze by pressing the tip of the pollex with the tip of the middle

finger , ring finger, little fingertip pinch respectively for measuring the three tip pinches as shown in Fig. 1



Fig.1

Waist circumference was measured in centimetres by using the elastic measuring tape under the recommended guidelines of WHO. The subject stood erect, abdomen relaxed , arms by the sides and with normal respiration. Assessment was done after the end of normal expiration and practice repeated test trails .

Hip circumference was measured in centimetres by using a measuring tape. Measurement was done keeping the measuring tape parallel to the floor. Waist to hip ratio was measured by using the formula $WHR = WC(cm) / HC(cm)$. Waist to height ratio was measured by using the formula $WHTR = WC (CM) / HEIGHT(cm)$. BMI was measured by using the formula $BMI = weight(kg) /$

$height(m^2)$.

Statistical Analysis

Difference between dominant and non dominant handgrip strength were compared using Independent T Test, Pearson's test .The relationship between pinch strength of dominant and non dominant side and anthropometric indices for analyzing , statistical analysis were done using SPSS version 20. P value <0.05 was considered statistically significant.

Results

A total of 67% of participants were right handed and

26% were left handed. Pinch strength of three pinches in dominant side were greater than non dominant side under the study as observed from table no. 1.

Positive correlation of Thumb middle finger tip pinch was found with all the variables. Significant association was observed with all the anthropometric indices except age, waist to hip ratio as seen in table no 2.

Negative correlation of ring finger tip pinch was found with age and significant association was observed

with all the anthropometric indices except age, waist to hip ratio, waist to height ratio & BMI as observed from table no.3.

Negative correlation of little finger tip pinch was observed with age and waist to hip ratio. Significant association was found with all the anthropometric indices except age, waist to hip ratio, waist to height ratio and BMI as observed from table no.4.

Table no 1: Baseline data of pinch grip strengths in the study population

Variables	Handedness	Mean ± SD
Thumb middle finger tip pinch	Right hand	11.68±3.14
	Left hand	11.18±3.13
Thumb ring finger tip pinch	Right hand	8.88±3.17
	Left hand	8.49±2.67
Thumb little finger tip pinch	Right hand	5.38±2.21
	Left hand	5.13±2.12

Table No.2

Variable	Side	r-value	p-value
	R	.037	.431
	L	.046	.331
Age (year)	R	.265	<0.001**
	L	.279	<0.001**
Weight (kg)	R	.124	< 0.009*
	L	.175	<0.001**
Height (m)	R	.269	<0.001**
	L	.175	<0.001**
WC (cm)	R	.229	0.001**
	L	.188	<0.001**
HC (cm)	R	-.004	.926
	L	.084	0.73
WHR	R	.194	<0.001**
	L	.137	0.004*
WHtR	R	.229	<0.001**
	L	.226	<0.001**
BMI (kg/m ²)	R		
	L		

Correlations of middle tip pinch strength with anthropometric indices

*p<0.05; significant;**<0.001;highly significant

Table no.3: Correlations of ring finger tip pinch strength with anthropometric indices

Variables	Handedness	r value	p value
Age (year) Weight (kg) Height (m) HC (cm) WC (cm) WHR WHtR BMI (kg/m ²)	R	-.006	.897
	L	.032	.498
	R	.154	<0.001**
	L	.164	0.007*
	R	.095	.045
	L	.142	0.002*
	R	.164	<0.001**
	L	.095	.045
	R	.141	0.003*
	L	.097	.040
	R	.001	.990
	L	.037	.428
	R	.113	.017
	L	.056	.238
	R	.121	.010
	L	.119	.012

*p<0.05;significant;**<0.001;highly significant

Table no.4: Correlations of Little finger tip pinch strength with anthropometric indices

Variable	Side	r-value	p-value
Age (year) Weight (kg) Height (m) HC (cm) WC (cm) WHR WHtR BMI (kg/m ²)	R	-.44	.353
	L	-.014	.767
	R	.128	0.007*
	L	.126	0.007*
	R	.166	<0.001**
	L	.175	<0.001**
	R	.173	<0.001**
	L	.182	<0.001**
	R	.110	.019
	L	.103	.028
	R	-.077	.104
	L	-.108	.023
	R	.058	.218
	L	.051	.283
	R	.063	.181
	L	.061	.200

* $p < 0.05$; significant; ** < 0.001 ; highly significant

Discussion

There was a significant association in case of thumb middle tip pinch and ring finger tip pinch with BMI, but not significant in case of little finger tip pinch. Middle finger tip pinch as well as little finger tip pinch showed negative correlation with waist to hip ratio. Ring finger tip pinch had very less positive correlation with waist to hip ratio (r value Right side = .001 and Left side = .037) in the current study.

It was found that the pinch strengths were high in male participants^{10,11,12}. Longer fingers and larger hand span have stronger pinch strengths and a significantly reduced risk of mortality rate¹¹. Present study findings are in coherence with these findings. Low to moderate correlation is reported between pinch strength and age¹³. This was also observed in the present study. It was observed that average pinch strength peaked between 35 and 44 yrs in men¹⁴. One study done on different medical professional groups established that dentists have maximum pinch strength among all the groups considered¹⁵. It was also found that pinch strength declines with rising age and was higher in dominant hand^{16,17}. The trend of pinch strength variation according to age was not analyzed in the present study but it was found to be higher in dominant right handed individuals. Positive association of pinch strength with BMI is proved by another study where subjects with normal BMI had significantly higher grip strength than overweight and obese group¹⁸.

Previously no study was conducted to find out the correlation between middle tip pinch, ring finger tip pinch, little finger tip pinch strengths with other anthropometric variables.

Limitations: The population under study is limited to medical students only, so results cannot be generalized over larger populations belonging to different professions or geographical locations for external validation. Although it was planned to include participants up to 26 years of age but very few above 23 years participated in the study.

Conclusions

This study showed that there is a positive correlation

of pinch strengths with anthropometric indices such as weight and height. Future studies should be performed to evaluate the risk factors for reduced pinch strengths which can directly or indirectly affects the health of the individual. These factors should be considered while giving training to sports personnel for their better performance.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from Institutional Ethics Committee (IEC) vide Project No. IEC-1132

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Management Practices among Diabetes Population in Rural Area of North India

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Abstract

Background and Objective- Diabetes is the serious public health problem in all the countries but majorly in developing countries. The prevalence of diabetes is rapidly rising in rural population. The characteristics symptoms are excessive thirst, polyuria, polyphagia, purities, and otherwise unexplained weight loss, or may be asymptomatic till complications present themselves ⁽¹⁾. Medication, exercise and yoga are holistic approach for controlled and prevention of diabetes and its complication in diabetic population.

Aims & Objectives –

1. To study the signs & symptoms of diabetes in rural population
2. To study management practices among rural diabetics populations

Study Design- A cross-sectional study.

Material & Method- By taking the prevalence of diabetes mellitus 13% in persons age 30 years & above by various studies & relative precision 20% the sample size come out to be 642, total subjects studied were 700 for uniform coverage in villages selected by systematic random sampling, fasting blood sugar was done to estimate the prevalence of diabetes. Rest of the information was collected on Predesigned and pretested questionnaire.

Results- the prevalence of diabetes were found to be 11.7% in persons aged 30 years & above in rural population of Meerut. A comprehensive approach to prevention of diabetes mellitus will require active participation of all sections of the community including health services to change the determinants of associated risk factors with diabetes mellitus. **Conclusions-** the diabetes mellitus is a significant health problem in rural population. Medication, exercise and yoga are holistic approach for controlled and prevention of diabetes and its complication in diabetic population.

Key words- Diabetes Mellitus, rural Population, Fasting blood sugar, yoga, exercise, medication

Introduction

Diabetes mellitus is a chronic non communicable disease and characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, proteins metabolism due to defect in insulin secretion, insulin action or both ⁽²⁾.

Non communicable diseases are increasing among the adult population in both developed and developing

countries. Diabetes is the serious public health problem in all the countries but majorly in developing countries ⁽⁴⁾. This is an important cause of disability and death not only in our country but also throughout the world ⁽²⁾.

The prevalence of diabetes is showing an upward trend in most countries. According to the 6th edition of International Diabetes Federation Diabetes Atlas, it is estimated that there are currently 387 million people with

diabetes worldwide and this number is set to increase to 592 million by the year 2035. China has the largest number of people with diabetes in the world (98 million) followed by India with (65 million). These figures of India are predicted to increase to 109 million by 2035. ⁽³⁾

The characteristics symptoms are excessive thirst, polyuria, polyphagia, prurities, and other unexplained weight loss, or may be asymptomatic till complications present themselves ¹

The prevalence of diabetes is rapidly rising in rural population. The prevalence of diabetes in rural Andhra Pradesh is 13.2%. The large number of individuals with poorly controlled diabetes, particularly in rural areas is worrying as this could potentially lead to development of chronic complications in this segment of population, as here diabetic care is currently not available, accessible, or affordable. ⁽⁵⁾

Material & Method

A cross-sectional study was conducted in the rural population Machhara block of district Meerut. There are 47 villages covering the 158188 population in Machhara block. The population wise list of all villages was obtained from Community Health Centre, Machhara.

Sampling size: Prevalence of diabetes mellitus in various studies in rural population was found to be 13% among persons aged 30 years and above. Therefore by taking the prevalence of diabetes 13% with 95% confidence level and relative precision of 20%, the sample size calculated was 642. A sample of 700 individuals above 30 years of age was taken for uniform coverage from 10 villages selected by systematic random sampling technique.

Period of study: The study was carried out from June 2014 to 31 May 2015.

Study population: The present study was conducted in a Rural Population of 30 years & above who belongs to Machhara block, Meerut.

Methods: This study was conducted by house to house visit in the selected villages. A population wise

list of all the villages covered under Community Health Centre, Machhara was obtained and divided by number of villages to be studied for obtaining the sample interval. Then random number was drawn from random number table and the village corresponding to that number was selected as first village and then subsequent villages were identified by adding the sample interval. Thus 10 villages were selected by cluster sampling. For selection of houses in the villages investigator went to the centre of the village along with ASHA and village Pradhan and the pencil was dropped and the direction of pencil pointing towards the house was chosen as first house and the next nearest houses were visited continuously without leaving a single house until sample size of 70 persons aged 30 and above was completed in each selected village. Two house visits were done in each family. First to collect the information pertaining to socio-demographic characteristics and other factors associated with diabetes on pre-designed and pretested proforma. And then second visit was done on next day early morning for doing fasting blood sugar of study subject by glucometer. In case any study subject unavailable on first visit, his/her information was collected on second visit along with fasting blood sugar test. However, if any person found unavailable on both the visits or showed non co-operative attitude was excluded from the study & another subject was included in the study from next house in continuation.

Statistical analysis- the data was checked thoroughly for its consistency and analyzed using Epi-info. Chi-square test was used to determine the statistical significance of association between diabetes mellitus and management of diabetes mellitus.

Results

In the present study 700 study subjects of aged 30 years & above were studied to know the prevalence of diabetes mellitus, and a total 82 cases of diabetes mellitus were found among the study population accounting for the diabetes prevalence rate of 11.7% in study population.

Table 1: Distribution of presence of symptom of diabetes mellitus

Symptom Of Diabetes Mellitus	Diabetes	
	Mellitus Status	
	Number	Percentage%
Increase frequency of micturation	73	89.0
Presence of ants at the place of micturation	64	78.0
Increased thirst or increase in water intake	77	93.9
Increased appetite	59	71.9
Feeling off and on numbness in some part of body	51	62.1
Feeling of reduced eye-sight	23	28.0
Becoming ill more often than other	29	35.3
Wound or other infection taking more time than normal time to heal	17	20.7
Feeling of tingling sensation in some part of body	33	40.2
Feeling of reduced efficacy of doing work or weakness	79	96.3
Feeling on and off pain/cramp in some part of body more usually in lower limb	47	57.3
Base	82	

Symptoms associated with diabetes mellitus in diabetics have been classified in table 25. Reduced efficiency of doing work(weakness) was the most common symptoms (96.3%) followed by increased thirst(93.9%), increased micturation(89.0%), presence of ants at the place of micturation(78.0%), increased appetite (71.9%). Other symptoms were numbness(62.1%),cramp in lower limb(57.0%),tingling sensation(40.2%),more illness(35.3%).reduced eye sight(28.0%)and wound taking more time to heal as compared to normal time(20.7%).

Table 2: Distribution of Treatment compliance in relation of Blood sugar status among known diabetics

		STATUS OF BLOOD SUGAR							
STATUS OF TREATMENT	Controlled (<126mg/dl)			Uncontrolled (≥126mg/dl)			TOTAL		
	Number	percentage%	Number	percentage%	Number	percentage%			
Taking									
Regular	18	78.3	05	21.7	23	39.0			
Treatment									
Taking									
Irregular	02	06.9	27	93.1	29	49.2			
Treatment									
Taking No	0	0	07	100	7	11.8			
Treatment									
Total	20	33.9	39	66.1	59	100			
X ² =33.10	df = 1	(P <0.01)							

For calculation of χ^2 categories Taking Irregular Treatment and not Taking Treatment were pooled together

One can see that 39% of known diabetics were taking regular treatment, out of them 78.3% had controlled blood sugar (<126mg/dl) , 49.2% of known diabetics were taking irregular treatment and majority of them (93.1%) had uncontrolled blood sugar (≥126mg/dl) .11.8% known diabetics were not taking any treatment and all of them (100%) had uncontrolled blood sugar (≥126mg/dl).The treatment outcome of diabetes mellitus was found to be statistically associated with treatment compliance (P<0.01).

Table 3: Distribution of Known Diabetics according to exercise and yoga Practices

Exercise And Yoga Practices	Controlled Blood Sugar (<126Mg/Dl)		Uncontrolled Blood Sugar (>126Mg/Dl)		Total	
	Number	Percentage%	Number	Percentage%	Number	Percentage%
Exercise Only	6	27.3	16	72.7	22	37.3
Yoga Only	5	29.4	12	70.6	17	28.8
Both Exercise and Yoga	8	72.7	3	27.3	11	18.6
None	1	11.1	8	88.9	9	15.3
Total	20	33.5	39	66.5	59	100

Table 3 clearly shows that 72.7% people practicing both exercise and yoga were having blood sugar control while only 27.3% doing exercise and 29.4% doing yoga alone had controlled blood sugar. This implies that those practicing both yoga and exercise are having better control of diabetes as compared to those practicing none of them. This difference in Blood sugar status in relation to Exercise and Yoga Practices was found to be statistically significant ($P < 0.05$)

Table 4: Impact of duration of exercise, yoga and both on blood sugar level among known diabetics

DURATION OF YOGA/EXERCISE	CONTROLLED (<126 Mg/Dl)		UNCONTROLLED (≥ 126 Mg/Dl)		TOTAL	
	Number	percentage %	Number	percentage %	Number	percentage%
<30 minute/day	4	14.8	23	85.2	27	54.0
≥ 30 minute/day	15	65.2	8	34.8	23	46.0
Total	19	38.0	31	62.0	50	100
X ² = 13.39,	df = 01,		(P<0.001)			

Table 4 clearly shows that diabetics patients practicing yoga , exercise or both more than 30 minutes (65.2%) had better blood sugar controlled as compared to diabetics patients practices yoga, exercise or both less than 30 minutes(14.8). This difference in proportion of blood sugar control in relation to duration of exercise/yoga was found

to be statistically significant ($p < 0.001$)

Discussion

Present study revealed that most common presenting symptom among the diabetics was weakness (96.3%), followed by increased thirst (93.6%), polyuria (89.0%) and, increased frequency micturation (89.0%), ant present at the place of micturation (78.0%), increased appetite (71.9%), numbness and tingling (62.1%), paincramps (57.3%), frequent illness (35.3%) delayed healing (20.7%), and similar findings were also observed by Bajaj et al (1984)⁽⁶⁾.

In the present study prevalence of diabetes mellitus was 11.7% out of which 71.9% were known case and 28.1% were unknown case of diabetes mellitus. Among the known cases 39.0% were taking regular medical treatment 49.2% were taking irregular treatment and 11.8% were not taking any treatment. Chow et al (2006)⁽⁷⁾ reported the prevalence of diabetes in rural Andhra Pradesh as 13.2%, of which 6.4% were known and 6.8% were previously undiagnosed. Out of those with known diabetes, 67% were taking oral hypoglycaemic therapy, 3% were using insulin, and 46% were taking blood pressure-lowering agents.

Hu YH, et al (1997)⁽⁸⁾, Qiao Qet al (2003)⁽⁹⁾, Weinstein AR et al (2004)⁽¹⁰⁾ and Sigal RJ et al (1999) found similar fact in their study noted that walking briskly for at least 2.5 h/wk (i.e., 30 min/day for 5 days/wk) was associated with a 25% reduction in diabetes over 8 yr of follow-up among those reporting no vigorous exercise. Study by Divakar MV et al (1978)⁽¹¹⁾, Sahay BK et al (1984)⁽¹²⁾ and, Sahay BK et al (1994)⁽¹³⁾ showed the role of yoga in the control of diabetes mellitus with significant fall in the blood sugar level soon after the practice of Pranayam.

Present study found the positive correlation of controlled diabetes mellitus with practices and time duration of exercise, yoga and both. It was seen that blood sugar is better controlled in diabetics' person doing exercise, yoga, or both more than 30 minute per day as compared to those doing less than 30 minute per day or nothing.

Ethical Clearance- Taken from INSTITUTIONAL ETHICS COMMITTEE OF LLRM MEDICAL

COLLEGE, MEERUT

Source of Funding- Self

Conflict of Interest- There is No Conflict of Interest For Any of the Author.

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3Role of Pre Operative Peritoneal Lavage in Patients of Perforation Peritonitis

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Abstract

Background- Perforation peritonitis is amongst the most common emergency condition in surgical practice and is a common cause of mortality in tropical countries like ours. Factors contributing to the high mortality rate include advanced age, late presentation, septicaemia, comorbidities and delay in the treatment. Previous literature has shown peritoneal drainage does improve morbidity and mortality. Not much literature is available on role of NS in pre-operative peritoneal lavage. **Aims and Objectives** - To assess and compare the morbidity, mortality and final outcomes of the patients who were given peritoneal lavage pre operatively with patients who were not given peritoneal lavage in the pre-operative period. **Material and Method-** 60 Patients, with generalised perforation peritonitis; reporting in MMIMSR, MMDU, Mullana, Ambala (Haryana); were included in this Randomised control study and divided into two groups. Group I (study group) underwent pre-operative peritoneal lavage under local anaesthesia and group II (control group) without pre-operative peritoneal lavage. The Mannheim's peritonitis index (MPI) of the patients was calculated and was used to estimate the probable outcome/prognosis of the patient. The haemodynamic parameters and vitals of the patient were recorded just before surgery, before induction of anaesthesia as well as at the end of procedure. On discharge the duration of stay of each patient, complication, suture site infection, recovery period were recorded and analysed using the appropriate statistical tests. **Results-** The ratio of male: female population in the study was found to be 5:1. 26 patients had MPI score of >25, 22 patients had scores between 15-25 and 12 patients had score of <15. In the study group after giving peritoneal lavage 80% (24/30) patients were stable while 20% (6/30) were unstable just before surgery, while in the control group 63.3% (19/30) were stable while 37.7% (11/30) were unstable. Only 20 cases (33.3%) required the ventilatory support later. 48 cases were discharged after recovery whereas 12 cases (20 %) expired. Favourable outcomes were seen in 93.3% (28 cases) of the lavage group and only 6.7 % cases expired. **Conclusion-** The pre-operative percutaneous peritoneal aspiration of the fluid and peritoneal irrigation and drainage in patients with advanced stage of perforation peritonitis documented by their high MPI score before definitive surgical source control is associated with a significant improvement in the pre-operative pulse rate and blood pressure, a decrease in the overall mortality and deep seated wound infection and dehiscence.

Keyword: MPI, Perforation Peritonitis, Patient, Haemodynamics, Peritoneal lavage

Introduction

Peritonitis is the most common emergency in general surgery and a serious life threatening condition all over the world, India is no exception to it. Peritonitis may be primary or secondary, but general management

is the same in both conditions. Majority of the patients present late, with purulent peritonitis and septicaemia. In the developing countries like India the perforations of proximal gastrointestinal tract is more common than the distal gastrointestinal tract.^[1, 2]

Although phenomenon of self- healing has been claimed to be efficient in 50% of patients yet a large number of patients require definitive treatment. [3, 4] Mortality of the patients of perforation peritonitis was as high as 90% in the early twentieth century. The mortality in such patients is still high despite advances in surgical technique, radiographic imaging, antibiotics and resuscitation therapy. The peritoneal cavity contamination leads to cascade of infection, sepsis, multi system organ failure and death if not treated in timely manner. [5, 6] Laparotomy is the gold standard for the definitive management of perforation peritonitis. In the event of high risk status of patient and non-improvement in general condition despite various intensive resuscitative protocols, the immediate laparotomy under general anaesthesia is not advisable. [7]

Co-morbidities further worsen the chances of survival and lead towards bad prognosis in spite of doing the management according to the focussed plan.[8] Factors contributing to the high mortality rate include advanced age, late presentation, septicaemia, comorbidities and delay in the treatment.[9] Majority of the patients are generally referred from the peripheral centres or a private practitioner as a result of which the patient presents late to the tertiary centre i.e. the perforation-operation(PO) interval time is higher.[10] In the event of high risk of patients and non-improvement in the vitals of the patient have led to delay in the surgical exploratory laparotomy under General anaesthesia (GA).[11] Thus resuscitation in such patients helps in the possibility of increasing the perforation operation interval time and final outcome of exploratory laparotomy in view of morbidity and mortality. On evaluating, it is generally found that the patients are resuscitated by Ryle's tube aspiration, intravenous fluid, and catheterisation by Foley's catheter and injectable antibiotics. [12]

Sepsis source control through percutaneous peritoneal drainage is not new. S. Paterson- Brown and H.A.F. Dudley stated that "in a circumstance of severe abdominal distension, peritoneal aspirate should be considered in order to permit the escape of gas and exudate, thereby providing an initial guide to the diagnosis in addition to relieving the cardiopulmonary effect of distension." Along with this they stated that "if the patient's condition still prevents operation, treatment may begin by running a litre of normal saline over

a period of an hour and then recovering it by gravity drainage." [13]

Aims and Objectives

1. To assess the outcome of the patient who was given peritoneal lavage pre-operatively.
2. To compare mortality and morbidity with patients who are not given peritoneal lavage pre operatively.

Material and Method

This study was conducted in MMIMSR Mullana, Ambala, Haryana (India), with the approval of ethical committee of the university. A written and informed consent was obtained from the patients. A Quantitative Research Approach with Random Control Trial was conducted on the patients of gastro intestinal perforation peritonitis, presenting to and operated upon in the Department of General Surgery of MMIMSR, Mullana, and Ambala (India) **Study Duration** September 2017 – June 2019 (2 years). **Population:** 60 patients were included in this study and divided into two groups equally and random sampling technique (Lottery Method). *Group I* included preoperative peritoneal lavage under local anaesthesia and *Group II* (control group) without preoperative intra-peritoneal lavage.

Inclusion Criteria: Patient's included who were diagnosed as a case of perforation peritonitis, presenting in emergency in various units of Department of Surgery who are willing to participate and of age > 18 years.

Exclusion Criteria: The patients not giving consent or did not undergo definitive surgery. Patients in whom bowel perforation was not found at the time of definitive surgery were excluded. Gall bladder perforation and patients with Spontaneous Bacterial peritonitis (SBP) were also not included in the study.

Method of Data Collection/ Procedure/ Intervention

Patients who came to emergency with complain of acute abdomen with clear suspicion of perforation peritonitis were admitted and evaluated in the following ways.

1. Accurate history was taken with respect to: Pain, Vomiting, Abdominal distension, Bowel and

bladder disturbance

2. Vital signs of the patient were recorded and based on the criteria of shock patients' vitals were tagged as "Stable" and "unstable".

3. Thorough clinical examination was done for the evidence of abdominal tenderness, guarding, rigidity, obliteration of liver dullness and peristaltic sounds.

4. Based on the history and clinical examination, provisional clinical diagnosis was made.

5. The Mannheim's peritonitis index (MPI) of the patients was calculated and used to estimate the probable outcome/prognosis of the patient. Data was recorded in proformas for analysis.

In conjunction with the conservative methods, pre-operative intraperitoneal lavage was performed under local anaesthesia through a 1-2 cm long midline vertical incision below or above the umbilicus/ in the right or left iliac fossa in 30 out of 60 patients selected in random manner.

Results

Table I: Distribution of patients' haemodynamics on admission between our two study groups

PRE OPERATIVE PERITONEAL LAVAGE						Total
		No	No	Yes	Yes	
Haemodynamics On Admission	Stable	13	43.3%	7	23.3%	20
	Unstable	17	56.7%	23	76.7%	40
Total		30	100%	30	100%	60

Table II: Distribution of patients in the two study groups on the basis of Mannheim's peritonitis index

Pre Operative Peritoneal Lavage						Total
		No	No	Yes	Yes	
MPI	<15	6	20.0%	6	20%	12
	15-25	13	43.3%	9	30%	22
	> 25	11	36.7%	15	50%	26
Total		30	100%	30	100%	60

Table III: Change in the haemodynamics of the patient on admission and before surgery.

Pre operative peritoneal lavage	unstable haemodynamics		Change	Chi square	P value
	On admission	Before surgery			
Yes	23	15	8	3.65	0.0002
No	17	19	-2		

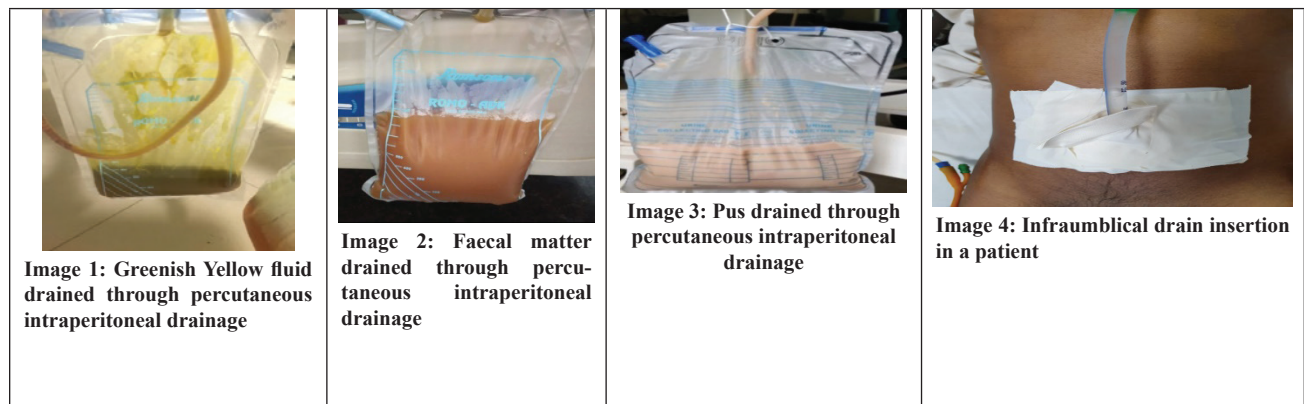
Upon recording the haemodynamic conditions on admission and before surgery, it was found that there were 23 patients with unstable haemodynamics and 15 upon resuscitation before surgery. Whereas, 17 patients presented with unstable haemodynamics and 19 ended up in unstable haemodynamics before surgery. The comparison has been done in the table III.

Table IV: Final outcomes in both the study groups

PRE OPERATIVE PERITONEAL LAVAGE						Total	Chi-square value	p-value
		NO	NO	YES	YES			
FINAL OUTCOME	Discharged	20	66.7%	28	93.3%	48	6.667	0.021
	Expired	10	33.3%	2	6.7%	12		
Total		30	100.0%	30	100%	60		

As shown in table IV, both the study groups were compared on the basis of final outcomes. Favourable outcomes were seen in 93.3% (28 cases) of the lavage group and only 6.7 % cases expired whereas in control group (cases in which peritoneal lavage was not performed, 20 cases (66.7 %) recovered and were discharged, and 10 patients (33.3%) cases expired.

Chi square test was applied and value came out to be 6.667. P value calculated at 95% confidence interval was 0.021 which was significant (<0.05).



Discussion

The patients were evaluated upon admission and depending upon the history, through clinical examination, radiological and laboratory findings were given probable diagnosis. In the present study of 60 patients, pre operatively 56 patients (93.3%) were diagnosed as perforation peritonitis, 2 (3.33%) were diagnosed as intestinal obstruction and 1 (1.7%) each as appendicular perforation and blunt trauma abdomen.

Out of total 60 cases, only 4 cases (6.7%) reported to the hospital within first 24 hours of commencement of the symptoms whereas rest (93.3%) reported later i.e. more than 24 hours of onset of symptoms. The data is consistent with study of Prabhu VV et al [12] where the mean of PO interval was 42.12 hours. In the other study done by Jhobta RS et al [14] around 47% cases reported in the first 24 hours and 53% cases reported after 24 hours. On admission, 60 patients in our study was analysed as per Mannheim’s Peritonitis Index (MPI)

and divided the patients into three groups based on score <15, 15-25, >25. In total there were 12 patients with MPI <15, 22 with MPI score 15-25 and 26 patients with MPI score >25. Due to late presentation and old age, maximum (26) patients had MPI of more than 25. The final outcomes of the patients were noted. 8.3% patients with MPI <15 expired, 13.6% of the patient with MPI 15-25 expired and 30.7% of total patients with MPI>25 couldn't survive. The incidence was similar to various studies which define mortality in MPI <15, 15-25, >25 as 4%, 14% and 50% respectively. [15] Out of 6 patients with MPI <15 and who were given peritoneal lavage pre operatively, there was no mortality whereas out of 6 patients with MPI <15 and no peritoneal lavage, 1 expired. In group of patients with MPI 15-25, 3 out of 13 patients expired, who were not given peritoneal lavage whereas there was 0 mortality out of 9 patients. The significant results were found in comparing the mortality in patients with MPI >25 between two groups. Out of 11 patients in control group, there were 6 mortalities and there were only 2 mortalities out of 15 patients who were given pre-operative peritoneal lavage.

In the study it was observed that in study group with pre-operative peritoneal lavage 15 patients were stable and 15 patients were with unstable haemodynamics before surgery whereas in the control group, 19 patients were still having unstable haemodynamics before surgery and 11 were stable pre operatively. Upon recording the haemodynamic conditions on admission and before surgery, it was found that there were 23 patients with unstable haemodynamics and 15 were still unstable after resuscitation before surgery in patients who were given pre-operative peritoneal lavage. Whereas, 17 patients presented with unstable haemodynamics and 19 ended up in unstable haemodynamics before surgery in the control group. On comparing the change in the haemodynamics and effect of resuscitation, it was noted that pre-operative peritoneal lavage had significant effect on resuscitation leading to stabilisation of haemodynamics of the patient over due time.

Conclusion

The pre-operative percutaneous peritoneal aspiration of the fluid and peritoneal irrigation and drainage in patients with advanced stage of perforation peritonitis documented by their high MPI score before definitive

surgical source control is associated with a significant improvement in the pre-operative pulse rate and blood pressure, decrease in the operation time, decrease in the incidence of post-operative ventilator support, decrease in the incidence of deep seated wound infection, dehiscence and overall mortality.

Acknowledgement: This is to acknowledge that the above said authors and carried out the research work titled "Role of Pre-Operative Peritoneal Lavage in Patients of Perforation Peritonitis". Hence we acknowledge that the above research was original work of authors.

Source of Funding: Self

Ethical Clearance: Taken from Ethics Committee, M.M. Deemed To be University

Conflict of Interest: Nil

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Nutritional Assessment Using 24 Hour Dietary Recall Method, Anthropometry and Clinical Assessment among Young Adults Studying in a Private Medical College, Thrissur, Kerala

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Abstract

Introduction: The three common methods for assessment of nutritional status are 24 hour dietary recall method, anthropometry and clinical assessment. **Objectives:** To assess the nutritional status of young adults using 24 hour dietary recall method, anthropometric measurements and using clinical assessments and to correlate between nutritional status obtained by these methods. **Methodology:** A cross sectional study was conducted on all the students of an MBBS batch in a private medical college. There were 100 students in total and each student was interviewed on 3 non-consecutive days (2 week days and 1 weekend day) in a dietary cycle using questionnaire for nutritional assessment to collect data. **Results:** Males were 30% and females 70% in proportion, with a mean age the study population was 21.69 ranging from 20 to 23. The mean of required calories per day was 2741.79 ± 528.65 . 84% of study population was consuming above the required calorie level and 16% were consuming below the required calorie level. The mean BMI was found to be 22.32 ± 3.58 kg/m². Body mass index of majority (51%) was found to be normal; 11% was underweight, 20% was overweight and 18% was obese according to modified Asian WHO classification. Waist hip ratio of 38% of total study population was found to be above the limits. On examination no clinical sign of vitamin or mineral deficiencies or excess were found in the study population. Average calorie intake was positively correlated with body mass index. Pearson Correlation Coefficient (r) value was found to be 0.536 and p value was 0.0001. This was statistically significant. **Conclusion:** As average calorie intake estimated using 24 hour dietary recall increased, body mass index increased.

Key words: Nutritional assessment, 24 hour dietary recall method, anthropometric assessment, clinical assessment, young adults, cross sectional study

Introduction

Emerging evidence demonstrates that overweight and obesity are increasing in the developing world. Three quarters of the obese population worldwide are projected to be in non-industrialised countries by the year 2025. [1] The state of being overweight coexists with under nutrition in developing countries. [2] The prevalence of non-communicable diseases such as hypertension, cardiovascular diseases, and type 2 diabetes is becoming a public health concern. In this

context periodic assessment of nutrition is important as dietary intake has been linked to important health outcomes, including several of the leading causes of death (e.g., cardiovascular disease, cancer, diabetes). [3] Three main methods used to assess nutrition are 24 hour dietary recall method, anthropometry and clinical assessment.

24 hr recall method (questionnaire method) is a method of dietary assessment of nutritional status. It is a relatively easy method based on the recall capabilities of the individual over a period of the past 24 hour and is fairly accurate.

Anthropometry and clinical signs are methods of direct assessment of nutritional status.

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Nutritional anthropometry is simple, quick to do, easy to reproduce and objective method for measurement of human body at various ages and levels of nutritional status. It is based on the principle that appropriate measurements should reflect any morphological variation occurring due to a significant functional physiological change. In some cases it identifies even subclinical changes resulting from nutritional variations.

Assessment of nutritional status using clinical signs is a widely practised method which is based on the examination for changes believed to be related to inadequate or excessive nutritional intake that can be observed in superficial tissues or in organs close to the surface.^[4]

The method used to assess nutritional status can vary depending upon the people who is assessing it. The nutritional status obtained using 24 hour dietary recall method, anthropometry and clinical assessment are to be correlated with each other to check whether the result obtained by each of these method are the same. This is important as the further management of nutritional excess or deficiency of the person depends on the result of these studies.

Method

A cross sectional study was conducted from June 2019 to September 2019 among all the students of 2016 MBBS batch of Amala institute of medical sciences, Thrissur.

Twenty four hour dietary recall was taken on three non-consecutive days (two weekdays and one weekend) in a dietary cycle by interviewing each participant using a questionnaire for nutritional assessment without prior announcement regarding the date of interview. This was done to ensure that participants were not making any alteration to their habitual diet during the study period. Participants were asked about all details including type of food, estimated portion size in terms of standardized quantities like 5 ml spoon, 15ml spoon, 200ml bowl and brand of food and beverages consumed for the previous 24 hours. For foods and beverages consumed from outside, participants were asked to recall as much detail as possible about them. All information collected during the interview was recorded in questionnaire.

A digital scale was used to assess the weight. Individuals were requested to remove shoes and heavy cloths prior to weighing. Height was measured by requesting the subjects to stand with their scapula, buttocks and heels resting against a wall, the neck was told to be kept in a natural non stretched position, the heels are supposed to be touching each other, the toe tips are to form a 45° angle and the head has to be held straight with the inferior orbital border in the same horizontal plane as the external auditory canal (Frankfort's plane). Body Mass (BMI) was estimated by dividing weight (kg) by square of height in meter (m²). Individuals were classified according to modified Asian WHO scale.

Waist to hip ratio (WHR) was estimated by dividing waist circumference by hip circumference. ^[5] The threshold WHR is ≤ 0.85 for women and ≤ 1.00 for men ^[6], above which superior distribution of adipose tissue was considered.

The clinical signs suggestive of vitamin and mineral deficiencies or excess were examined.

The clinical signs suggestive of thiamine deficiency are bounding pulse, warm extremities, peripheral oedema, and progressive peripheral neuropathy. The sluggish tendon jerks, anaesthesia of the skin (especially over tibia), Muscle wasting was checked. Confusion, low levels of consciousness and poor coordination (encephalopathy) was also noted.

Clinical signs indicative of riboflavin deficiency are cheilosis, angular stomatitis, magenta tongue, nasolabial seborrhoea and genital (scrotal or vulval) dermatosis.

Deficiency of nicotinic acid causes dermatitis (skin exposed to sunlight gets inflamed, that progresses to pigmentation, cracking and peeling.),diarrhoea (accompanied by scarlet tongue),dementia(present as mild confusion and disorientation to mania and psychosis.).

Dietary folate deficiency maybe accompanied by depression, insomnia, forgetfulness, irritability and dementia.

Deficiency of cyanocobalamin causes malabsorption. Neurological symptoms characterized by loss of sensation and motor power in the lower limbs (due to degeneration of myelin) would also be seen.

Ascorbic acid deficiency would be manifested as spongy and bleeding gums, perifollicular haemorrhages in the skin and poor wound healing. Fatigue and muscle weakness would also be seen.

Signs and symptoms of vitamin A deficiency are dryness, itching, redness of conjunctiva, night blindness (inability to see in dim light), Bitot's spots; corneal xerosis; keratomalacia; dry rough itchy skin; rash; dry brittle hair and nails, loss of acuity of senses: smell and taste, loss of appetite, fatigue, poor growth, low immunity: increased vulnerability to infections. Vitamin A toxicity would be characterized by dry lips (cheilitis), dryness of nasal mucosa and eyes, erythema, scaling, peeling of skin, hair loss, nail fragility, hip fractures (Bone abnormalities).

Deficiency of vitamin D would be characterized by skeletal deformities, bone pain and weakness.

Vitamin E deficiency would be characterised by reduced tendon reflexes, loss of touch and pain sensation, unsteady gait, loss of coordination and impaired eye movement.

Deficiency of vitamin K would be characterized by bleeding tendencies.

Deficiency of calcium levels would produce tetany, characterized by twitching of muscles of face, hand and feet. Cardiac arrhythmias would also be seen. Long term calcium deficiency would manifest as stunted skeletal growth.

Sodium deficiency would manifest as muscle cramps and severe dehydration.

Cardiac arrhythmias and muscle weakness are indicative of potassium deficiency.

Magnesium deficiency would be manifested as apathy and muscular weakness.

Anaemia indicates iron deficiency.

Deficiency of iodine manifests as hypothyroidism characterised by lethargy, poor cold tolerance, bradycardia, and myxoedema.

Fluoride toxicity is manifested as mottled enamel.

Deficiency of zinc is characterized by growth

retardation, delayed sexual maturation. Zinc deficiency may present as a tetrad of symptoms comprising of neuro-psychiatric changes, dermal lesions, diarrhoea and alopecia (Acro-dermatitis Enteropathica).

Copper deficiency usually presents as chronic diarrhoea.

Selenium deficiency is associated with coronary artery disease and Kashin Beck syndrome.^[4]

The data collected by interview and examination was entered in Microsoft excel and analysed using SPSS version 23 software

Results

The whole 100 students of 2016 MBBS batch of Amala institute of medical sciences responded to the study. The mean age was 21.69 ranging from 20 to 23. The study population consists of 30 males and 70 females.

A large proportion of the study subjects were Christians (66%) and then followed by Hindus (22%) and Muslims (12%). Most of the subjects were hostellers (92%) and only few were day scholars (8%).

Table 1: Occupational categories of father's of the study subjects

	Frequency	Percentage
Professional	83	83
Teacher	8	8
Skilled worker	5	5
Unemployed or retired	4	4

Table 2: Occupational categories mothers of the study subjects

	Frequency	Percentage
Professional	24	24
Clerk	1	1
Teacher	19	19
Home maker	53	53
Unemployed or retired	3	3

Mean monthly income of both the parents of study subjects was 95650 ± 85793.43 Indian Rupees.

The mean of required calories per day of the study population was 2741.79 ± 528.65 . Consumption of calorie above the required level was found in 84% of study population and 16% were consuming below the required calorie level.

The mean of required protein per day of the study population was 60.58 ± 13.16 . Overconsumption of protein was found in 83% of study population and 17% were consuming below the required protein level.

The mean BMI was found to be 22.32 ± 3.58 kg/m². Almost half of the study population were in the normal BMI range (51%). 11% of the subjects were underweight, 20% were overweight and 18% of the subjects were undernourished.

Table 3: Nutritional status according to BMI

	Frequency	Percentage
Underweight	11	11
Normal	51	51
Overweight	20	20
Obese	18	18

Average calorie intake was positively correlated with body mass index. Pearson Correlation Coefficient (r) value was found to be 0.536 and p value was 0.0001. This was statistically significant.

Table 4: Average calorie consumption according to BMI categories

BMI	Average calorie/day		P value
	Mean	Standard deviation	
Underweight	2474.73	818.44	.0001
Normal	3691.79	816.99	
Overweight	4157.45	475.61	
Obese	4336.05	317.73	

The mean waist hip ratio in males was found to be 0.89 ± 0.0566 and in females it was noted to be 0.87 ± 0.0562 .

About one third of the study population (62%) was having waist hip ratio within normal limits. This included 33% females and 29% males. 38% of the study population (37% females and 1% males) had waist hip ratio above normal limits.

On examination no clinical sign of vitamin or mineral deficiencies or excess were found in the study

population.

Discussion

The studies on correlation between nutritional status obtained by 24 hour dietary recall method, anthropometry and clinical assessment are scarce.

The mean of required calories per day of the study population was 2741.79 ± 528.65 . Consumption of calorie above the required level was found in 84% of study population and 16% were consuming below the required calorie level.

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On examination no clinical sign of vitamin or mineral deficiencies or excess were found in the study population.

Conclusion

Average calorie intake of the study population estimated using 24 hour dietary recall method was positively correlated with body mass index. As average calorie intake estimated using 24 hour dietary increased, body mass index increased. The mean of required calories per day of the study population was 2741.79 ± 528.65 . The mean of required protein per day of the study population was 60.58 ± 13.16 . The mean BMI of the study population was found to be 22.32 ± 3.58 kg/m². The mean waist hip ratio in males was found to be 0.89 ± 0.0566 and in females it was 0.87 ± 0.0562 . Nutritional status assessed using 24 hour dietary recall method, anthropometry and clinical assessment are giving identical results of

the study population, and they can be used to assess nutritional status of individuals.

Acknowledgement: We thank Dr. Sr. Nisha Catherin, department of community medicine, Amala Institute of Medical Sciences, Thrissur, Kerala, India; the management of Amala Institute of Medical Sciences, Thrissur, Kerala, India and also to all those who participated in the study for their cooperation and for their support for this research.

Funding: No funding sources

Conflict of Interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Slow Learners and Low Achievers Can be in the Limelight with the Toppers- A Ray of Hope for Zero Rejection-a Qualitative Analysis

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Abstract

Slow learner is who may have poor language skill in writing and communicating. They run into poor judging skills and illogical reason to the theory classes. Slow learners always can't get along with the same age mate companionship, but show proficiency in particular task which might not be the curriculum relevance. They always expect to have novel way of transferring the details to teach the old concepts. On the other hand learning disability experiences physical retardation to speak, write and calculate, inadequate motor skill to coordinate and cooperate the live class room activities. The academic institution unfailingly stumble on such individuals who want to do a regular stream of graduation. If the college can tailor the curriculum to feed such expatriates, inclusive growth and human rights will be flagged to raise the institution profile to a prominent culmination among the horizons. The study administered to underpin the postulation was a qualitative analysis made among the low achievers of 300 adolescent college students in Tiruchirappalli, who were desperately forgotten by the college tutors and the mentors sharing their plight of reality they are in and the Pandora dream they hold back to become in reality. The focussed group discussion and the findings make intelligible explanation about the essential modified curriculum which will be a ray of hope to all poor scorers and the learning disabled, a regular college education leaving Zero rejection

Key words: Academic Inclusion, Zero Rejection, Adolescent College students,

Introduction or Background

¹“Small minds are concerned with the extraordinary, great minds with the ordinary.” small mind can manifest the great and extraordinary output while great minds are tuned to think in the regular pattern as the majority fashioned to think. Academic arena always have a struggle for the aspiring and under aspiring individuals. ⁷The SDG goal for the 2030 states Zero Rejection as one of the prominent goal along with quality education with gender parity.

Methods or Materials

²Focus group come in numerous shapes and sizes the methodology adopted for the study was based on which stated that a minimum of 10-12 participants to be included in a single group. The method also mandated that the nature of the group should be based on its

homogeneity because composing a group with highly different characteristics will decrease the quality of data. ²Further emphasized that the focused group should comprise of the essential elements and the researcher tried to incorporate the same model adhering to the methodology in conducting FGD's.

Selection Criteria

⁴The researcher selected 24 respondents with low rating. As denoted, the presented procedure is called 'sampled Group' and does not require a Specific sampling structure but rather focus on the researchers' convenience. Informed consent for the participants willing to participate in the research process was also systematically done while adhering to the ethics and norms of research.

Conative Model in a focused Group Discussion:

⁵Conative is a term coined by Mary Goodyear 2013, and this term refers to a style or approach to focused group discussion in qualitative research that is interpretative and based on the humanistic approach. Its primary objective is to achieve understanding of a topic or issue in the respondent's own terms. ⁴The researcher adopted this model using a set of structured interview questionnaires depicted in the focused group scripts with an objective to portray and achieve an understanding pertaining to the factors that led to the respondents having a low rating in achievement motivation.

Group I

Group Discussion- Outcome

Though the respondents' hesitated to initiate the conversation after the sentence completion test; they started spontaneously volunteering in the discussion when their individual contribution was disclosed without their names. Every respondent manifested that society is "WE" and "WE" alone. "If I am ok why should we blame society". "Society should be positive to the youngsters". Few others expressed that society means it defines only for the upper class and the son/daughter of the highly occupied personnel. Law, police station and educational institutions are working impartial. "Society demotivates us all"

Most of the respondents say that once their parents felt their son/daughter is grown up, total responsibilities are displaced and they totally go uncared. "My mother never cares even I come home by 3 am", "I rule and my rules only at home". Girls mutually say they get total freedom to move around, but there are times when phones are checked and bags are raided. Respondents strongly enforces that parents/teachers should not treat/guide their children by their own bitter experiences but rather they have to look upon the contextual scenarios also.

Respondents' felt that colleges are more syllabus and semester driven but not teaching what life is. We as young college students forget to represent our teachers as the best friend. They always look up on us with inquisitive eyes if they come across any mistake we commit.

"The girl whom I love madly, left me like this"

"My parents will never ask me where you are going. They will let me go free"

"I am a good dancer but fear of myself itself the problem"

"No money so I am deprived of extracurricular activities"

What made them to go so uncared of self and about the future?," the immediate response is that friends and their social gang made them to do many risk taking adventurous and cinematic behaviours.

"I practiced and quit all types of drugs but still I consume brown sugar and alcohol"

"When I was with my friends I can even murder"

"As Friends we always motivate each other to have an affair to avoid boredom"

"I regret for my friendship"

They also said that each of them spend a lot of money to maintain their friendship and their specific existence. To accompany the techno trends of Social networks all the respondents' need to spend money for mobile data, not only for the self but also for their girlfriends and boyfriends too. They comment that Social networks and pornographies, parties and outings have made them hold a low self-esteem and they hold a low spirit, yet the respondents do it all voluntarily to seek and reveal their identity.

Irrespective of their economic class, all the respondents make up their appearance as an upper middle class boy or girl, for example they spend on latest out fits, trending with branded accessories, high-end mobile phones, bike, and other gadgets. Every respondent accepted that they mint excessive money from their parents more, other than fees, and spend for parties and get-togethers. While expressing their views some were regretting for their ill-mannered behaviour, but some felt that there is pleasure in such activities.

Willingly knowing all the ill effects and evils, the respondents verbalize that:

"I use brown sugar and stuff"

“I drink alcohol and stay night out”

“Though not possible in my family to have a boyfriend I’m having one”

“I never tasted alcohol but now I’m an alcoholic and mentally depressed because of love failure”

Closing/Summary

The core discussion of the above FGD clearly reveals the present situation of the respondents’ who attended the FGD. As this group discussion focused not to teach about a guide or a manual but to learn the reason behind the low rates in quantitative analysis.

Being vigorously active, they bring in lot of mess, always procrastinate, and work lethargically on their own pace. They always wish the society to keep their world undisturbed because, they say and see lot of pit falls in adult planning and adult politics. They advocate their world to be serene and they request others not to spoil the peace they enjoy. Though they achieved nothing in this young age yet they are beautiful as they are honest in accepting their inabilities.

Most of the respondents’ wanted their professors to be a helping hand to guide and to direct, but not a yardstick to measure on what they are, and what they were incapable of, but they needed light to have a good future.

Not many of the respondents were satisfied by the parenting methods they experienced. They individually grumble that either of the parents were highly vigilant while the other is totally least bothered about anything, while the boy children say that they were given too much of freedom and trust and they were ignored in turn they lacked monitoring. None of them were guilty for what they possess; their emotional instability and social inadequacy.

Group II

Group discussion- Outcome

The discussion initiated by the moderator and inquired from the group, the reason for latent emotionality’s and abnormal range of emotional expressions. Almost all the group members unanimously stated that the nurturing pattern since their childhood was weird, that their

parents were solely responsible for such unfavourable emotional outlet now colouring their adolescent stage “*I always want to be in good emotional climate, but my mother will never allow me to live a life of my choice*”.

The Painful ventilation is that “The only everlasting villain is my father who sees me as a doll to dance for his tunes”. Every group member tagged themselves with the same statement, “If we were allowed to socialize blissfully we would have matured socially by this time”.

They also revealed that, the respondents true desires were not recognized when they were schooling, so now they preferred to do whatever they want, because of the age, and development of autonomy in their hand.

Probing the respondents further, they shared that they are happily living their life with friends, outings and chatting, which keeps their mind fresh. They were able to trend out, freak out, the way they want. Motivation in achieving was far somewhere in their lifespan and they stated that this is the age meant for mere recognizing and identifying what they love.

“I chose fine arts club in my college and never attend classes”

“I prefer to bunk class and stay with old friends for drugs/ alcohol/ movie”

“I love to bunk and move out but I do the same stuff in mobile phones”.

All the respondents’ curiously ventilated that it is very difficult to receive money for tuition fees, so to fulfill the individuals need to dress, drive, hangout, they will demand excess money as fees, or go for part-time jobs, indulge in any work that offers instant payment. Somewhere happily for the unapproved causes. Sharing their own experience of stealing money from the wrong sources. The members all have an impression that each of them having their ego wrapped with shame, hurt and lack of resources along with biased parenting. The only motive at this age was to flourish their own desires than their parental will and wish they have for their daughters/ and sons.

The respondents stated, that “*My home taught me to suppress my desire rather to race for achieving that*”. The other says, “*My father often says all your desires/*

wish/ambition is “ok” for high socio economic class sons and not for us”, and majority accepted this. The family taught us to wish a desire, which is nominal for a lower middle class family. When the moderator asked for explaining the way, they made their life. They said as follows:

“I earned and bought a costly bike and happily riding that in pride”

“I selected a dance floor qualified myself a dancer and now I am a choreographer”

“I am what I am; living happily in hostel hiding myself from family and nauseating rules”

The moderator re-caped the discussion and posted the reason for lower/poor academic performances. Without any hesitation, group members confront that:

“Teachers are not teaching they are working for a corporate target” “Academics are tertiary to me”

“College is to make friends and I am done with that”.

These verbatim capsules with molecules of negative parenting, inadequate economy, unstable mood and wrong decisions, negative peer pressures as reasons for going astray. The moderator led the discussion based on the fact of achievement motivation among them. They shared the feeling of conviction that they need to achieve and they have lot motivation owned in their personality.

Thus, the discussion totally revealed the language and amicableness of all employees were not to a great extent. The moderator concluded the group discussion and highlighted the major findings in order to ensure the validity on the statements made. The key findings revealed that the psychological and sociological developments rely on the childhood experiences and the kind of parenting style adopted in their respective houses.

Closing/summary

The moderator concluded the group discussion by revising the key points discussed and addressed in the group discussions. The major findings revealed that they were under the pressure of achieving the development

standards what media has portrayed.

When addressed about their college life they revealed that they expected the institution to be a thrust for the needy but in reality they found that colleges were giving preferences to the higher socio economic class, high proficiency and language and the rest were ignored. Most of the respondents stated that the priority of the college was to check the student’s punctuality and complete the syllabus. They also stated that there was a different way of approach depending on the student’s ability. They expected colleges to be a platform to unbiased learning and growing. By doing so, if the respondent’s family failed to develop their children psychologically and socially adaptive, the college will bring up the inmates psychologically and socially equipped apart from academics.

Findings

Convergent findings:

³Similar thought process were perceived as convergent findings. The common thought shred was, that parents were irresponsible, being conventional that suppressed their emotional and social maturity contextually. All were aggressive with uncontrolled emotions in some way or the other. All the group members were having poor academic records and lack of attendance the reason they state for this back logs were friends circle. Bunking classes for jolly trips or not just staying away from classes but also loitering inside the campus. Partying out is a way of defending their damaged ego and displacing the same with lot of friends, social media, and related socialization. All the three groups inevitably explained that the parenting style was not the sort they desired for. The real want of the hour to them was mere recognition and social attention from their parents and teachers, which they were deprived off.

Divergent findings:

Majority of the respondents from group 1 inferred that a family handling their adolescent child brings in many success and failure stories. They all have a wounded ego and end up in wrong relationships because of the blind trust parents have on their kids. Parents are either not vigilant or over vigilant, which fails poor in the development of an individual. While the other two

groups surmise that controlled parenting has resulted in unpleasant childhood and it has also affected their emotional and social stability. Majority of the respondents from Group 1 and 2 have records of indulging in malicious acts and remanded in police stations and still narrating the same without any conviction. While the third group appears to be athletic and allured in nature and have no evidence of drug abuse, no love affair, but contemplate that society, and family are the nurturing environment and that they can join them at any time. Most of the respondents were academically on a low profile, the reasons are contradictory and divergent in nature.

Conclusion and Suggestion

The under achievers or the low scorers are neither disabled to learning nor incapable to comprehend, but a modified approach in education's programmed instruction can be a scope to revitalize their position in academic zones. Academic achievement motivation is every body's desire to be the start line of the race but not all have the same spirit to follow the old fashioned or regular mannered structure to be the achievers. Sugar can be the single ingredient desired to be mandatory in all the sweets but now sugar has many alternatives to match the tastes of the cravers who are diabetic too. Updated trends are the only example to set our mind to start one of a kind of a research. Academics achievement motivation is a flavor that brings wonder depending on the factor that induces or reduces success, so which is the main feature to draw such flavor is the developmental stage or the age group that plays the key music.

- Home is the prime learning institution which ponders the effect by various factor by quality parenting and adequate emotional and social maturity.

- A child with adequate parenting can develop a matured emotions and matured social

- School or college is the secondary home

- If home failed to sow, the learning centers has to be the nurturing source.

- Outcome based education and customized ranking pattern can be ensured

- Drill on the wholesome education and peel out the convention mod of education

- Perceive adolescents with the fullest cognitive potential and not on the behavior manifested.

- The college can also affirm various extra curricular, industrial startups and incubation centre to receive contribution variedly across intellectual domain

Funding Source: Self

Conflict of Ineterest: Nil

Ethical Clearance Committee: The ethical board comprises of the respective college Dean of student affairs, Dean of Research and Development and the three college Principles met in a common consensus and acknowledged the research questions and the intention of the FGD were well discussed and the verbal consent was received by the team in person and the researcher was allowed to proceed with the same.

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Perception of the Visually Impaired Students Towards Inclusive Education in Mainstream Higher Educational Institutions (with Special Reference to Multimodal Material Preparation Center, Bharathiar University - Coimbatore)

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Abstract

Leading a dignified life is not only a desire but also a fundamental right of any Human being. With Disability being an important global problem across the world, the Persons with disability struggle to lead a dignified life in the society. Despite advancement in Science and Technology, the issue of disability still remains a challenge and demands rapid intervention strategies to curb the barriers that curtail the development of individuals with disability and the nation at large. The aim of this study is to know the perception of the visually impaired students towards Inclusive Education in mainstream higher educational institutions. The evident based case study method of study design is used, where the Multimodal Material Preparation Centre of the Bharathiar University, Coimbatore on the whole is taken as the unit of analysis for the study. This study investigates the concerns of the visually impaired students studying in the Bharathiar University based on the in depth interview conducted with the students of various mainstreams of higher education who are making use of the material preparation centre of the University. The findings of the study reveal the overall perception of the visually impaired students towards Inclusive Education in all the aspects of availability, accessibility and affordability of education, where it becomes the evident study. Thus this study implicates greater scope for social work practice and further research in this area of Inclusive Education which will create a positive inclusive society.

Key Words: *Inclusive Higher Education, Visually Impaired students, Multimodal Material Preparation Centre, Inclusive Society*

Introduction

“You have a responsibility to make inclusion a daily thought, so we can get rid of the word ‘inclusion.’”

-Theodore Melfi

Persons with disabilities constitute a significant proportion of the minority population in the world. There are several types of disabilities, including intellectual and physical disabilities. Though an intellectual disability is different than a physical disability, such as visual impairment, students receiving special education services for any disability share common experiences. All students identified with a disability in the educational setting are considered to have significant impairment emotionally, intellectually, or physically that requires

them to be provided with extra resources and assistance to achieve in the academic setting.^[1]

Vision Impairment

Vision Impairment can occur at any age group. Visual impaired people are those who suffer from the impaired conditions, difficulties and deficiencies present in their visual organs which make them different from people with normal vision to extent of requiring special provisions. Visual condition of them remains the same throughout their life. Some conditions might cause vision problem only for the shorter period of time whereas other conditions might get worse over time resulting in poor vision or blindness when they grow older. When one can't see all the things that one should be able to

see in their age it is regarded as the low vision. These visual conditions include low vision, blurred vision, or the loss of side vision or may not be able to see and identify the colours. Visual impairment typically calls for the change in life style and solid support system . In the various forms of disability vision impairment has the highest range of difficulty, problems and risks because without vision the world becomes dark and one cannot see what is happening around the world . Without vision it is strange situation and time for the children where they will be very much eager and interested to know what is happening around them as they can feel the environment with their other senses of hearing , smelling , touching etc. So it makes the visually impaired people to feel for their disability which affects their mental health as they start thinking negatively about their life.

Inclusive Education

Inclusive Education is an approach towards educating the children with disability and learning difficulties with that of normal ones within the same classroom, regardless of their strengths or weaknesses in any area, and seeks to maximize the potential of all students.^[2]

Providing all students in general education classes with high-quality instructions, intervention, and support is a hallmark of inclusive education. It is one of the most effective ways to promote an inclusive and tolerant society, constructed on the basis of human values and morals.^[3]

Inclusive education is education that has everybody, with non-disabled and Disabled people (including those with “special educational needs”) learning together in mainstream schools, colleges and universities. This means the system should adapt to incorporate Disabled individuals –The education system should recognize that it creates barriers for Disabled learners, for instance if parts of the school are inaccessible.

Disabled pupils and students might need variations and support to access the information.

Such adaptation and support will make disabled students more independent and it in-turn improves their psycho-social condition and their quality of life. Comparing to the special schools, the inclusive

education in mainstream schools is more preferable for the children with disability as it helps them to have a better quality education as like normal people without any discrimination.

Visually impaired students in the Inclusive education cope up with their studies with the special reading aids in the accessible way. In today’s technology world the availability, accessibility and affordability for the education for the students with disability in this inclusive society is in positive way comparing to the past but still there lies a gap between all the areas for bringing in and creating a positive reach to the inclusive society.

Multimodal Material Preparation Centre for Persons with Disabled

Multimodal Material Preparation Centre for Persons with Disability has been established in the Bharathiar University since July 2013. The resource center is being supported and facilitated by Department of Social work. The center has advanced softwares installed in computers for those with low vision, locomotor disabilities, cerebral palsy, and visual and hearing impairment. Examples: JAWS Pro Talking Software, PacMate 20 Cell Braille Display, Index Basic D Braille Embosser and Duxbury DBT Win Braille Translation Software. It is open to all the students from all institutions on working days from 10a.m. to 5p.m. at free of cost. This study be the pathway for the theme of Inclusive society where this centre in Inclusive educational institution be the successful model for supporting the differently abled students by providing all the required special aids for their education in the easily available, accessible and affordable way. As like this centre all the educational institutions should make a start for strengthening the inclusive education with all the available resources in the accessible and affordable way for all the mainstreams of educational field. Though differently abled people forms the minority group this should not paves the way for discrimination. For this Inclusive society only be the key factor for ending all forms of discrimination with the differently abled people and it enhances the quality of life of them in this inclusive normal world.

Importance of the Study

The growing body of analysis has shown that student

do higher academically once in comprehensive settings and Inclusion provides opportunities to develop relationships.

Higher education provides individuals with a chance to mirror on the crucial social, economic, cultural, moral and spiritual issues facing humanity. It contributes to national development through dissemination of specialised information and skills.^[5]

Research Methodology

Study Materials And Methods:

The aim of this study is to know the perception of the visually impaired students towards inclusive education in mainstream higher educational institutions.

The evidence based case study design was used which provides the in depth knowledge about the perceptions, concerns and experience of the visually impaired students about the availability, accessibility and affordability of education in the inclusive society.

Study Questions:

What are the perceptions of the visually impaired students towards inclusive education?

How the Multi model preparation centre be the supportive system for providing quality inclusive education to the visually impaired students?

Tools For Data Collection:

The Multimodal Material Preparation Centre on the whole is taken as the unit of analysis for the study. The case study approach was adopted to know about the centre on the whole of its importance, provisions and its supportive system for providing special educational aids to the visually impaired students in the available, accessible and affordable way. This study had been done with the MMPC educational trainer.

The in depth case study had been conducted with 6 visually impaired students who are making use of the MMPC through interview schedule.

Sources of Datacollection:

Primary Data:

The case study had been conducted with the

educational trainer and visually impaired students through interview schedule.

Secondary Data:

Secondary data is collected through Review of literature ,Internet articles , journals , news papers.

Limitations Of The Study:

This study focuses only the visually impaired students and not the other form of disabled students.

This study takes the visually impaired students only who are visiting the MMPC and not the others.

Findings

The findings of the study reveals as,

The socio demographic factors of the 6 respondents are, all the selected visually impaired students are male, doing their PG degree in Bharathiar University, staying in hostels and have limited family support, they are from rural area, they had their school education in special schools and college education in inclusive setting, they do their education by receiving various scholarships.

The perception of the respondents towards Inclusive education are,

The visually impaired students have positive attitude towards inclusive education where they come out of their limited circle of their special zone and able to be with the normal people and adopt themselves to lead their life in this normal world.

In their perception the Multimodal Material Preparation Centre is very useful and be the greater supportive system for being under inclusive education where this centre provides all the special alternative educational aids for coping up with the general educational curriculum and syllabus.

From the experience of their education from schooling to the college , in schooling they were in special blind schools were they were in their own limited circle where they felt very low and discriminated from the society, but when they came into contact with the mainstreams of inclusive educational setting it improved their quality of life in educational aspects and they had good psycho social condition and felt positive about

their life.

The Inclusive education improved their psychological status and developed their adjustmental, inter personal skills.

In the availability aspects of education the visually impaired students felt that because of this centre within the university make us available with all the required materials for studying with the available special educational aids and by the support of the trainer at the centre. All the new technologies are made available in the centre for meeting up with the special educational needs which removes their barrier for studying in inclusive field.

The availability of such centres within the university is very essential and useful where the visually impaired students easily making use whenever they are in need of it. It reduces their efforts for searching the reading materials outside and saves lot of time where they can relaxly concentrate in their studies without any issues.

In the accessibility aspects such supportive centre within the university are in greater accessible way where the students can make use of it as and when they required.

The trainer in the centre helps students in recording and scanning reading materials and also teaches the students to make use of the reading software in the system where these all forms and be the easy accessible ways for the visually impaired student's education.

The students also felt that such supportive centres are needed in all the educational institutions as by which it only provides fulfilled inclusive education. From their previous college and school experience the supportive centres are not available in all the institutions and the students need to go to common centre in one place and meet up with their educational needs even if they were in inclusive education. So such institutions without any supportive centres provides inaccessible situations to the students.

The University provides disable friendly infrastructures and environment which acts as an adaptation mechanism, making the entire university accessible for the differently abled students .

In the affordability aspects as the MMPC is for free of cost it be easily affordable to the visually impaired students. The students also prefer such affordable way where they can continue their education from their lower economic status.

All the available new technologies for meeting with special educational aids are very costly for the individual to make use of it. So making it available in the educational institution at the free of cost is very useful for the students as they felt very beneficial.

Thus by having in depth interview form of case study with 6 visually impaired students who are making use of the MMPC in the university revealed their perception towards inclusive education with their own individual experiences. On the whole the students showed positive feeling towards inclusive education with supportive centres to meet up with their alternative educational special needs.

Discussion

From this evidence based study, it is very clear and understandable that the education with all the available, accessible and affordable aspects in the inclusive society shows positive attitudes towards the visually impaired students only if they properly reach their hands.

The inclusive education for the differently abled people be the facilitating factors in the psychological, social, environmental and educational aspects. yet there be the certain barriers such as adaptation mechanism and supportive system for making them available in the inclusive settings.

For overcoming such barriers the supportive centres as like in Bharatyar university the Multimodal Material Preparation Centre be the key factor.

As the available, accessible and affordable aspects in this centre are easily and properly in reaching hands to the students their perceptions towards inclusive education is in positive way. But this perception change in negative way with those students where those three aspects be difficult for reaching out with the students. So they will show negative attitude towards Inclusive education.

Like this supportive centres all the educational institutions should take step for starting up

In order to providing a better quality inclusive education.

For adaptation mechanism the educational institutions should form and build a differently abled friendly infrastructures and environment.

Though it is able to provide education in this inclusive society in the available, accessible and affordable way most of the institutions are not coming forward to provide such inclusive education. So such supportive centres, systems and adaptation mechanism needs to be strengthened in this developing stage for making such minority groups noted and treated as alike.

If all the educational institutions are ready to provide such form of good and proper inclusive education then it will be more beneficial to the differently abled students to perform well in their educational field and to have a bright future.

Suggestions:

- Strengthening of aids and supportive centers in all the educational institutions is very essential for creating Inclusive setting.
- Proper training is to be provided to the teachers about the SE aids and technologies.
- Awareness about the available technologies and aids is to be created among differently abled people.
- Awareness of the importance of Inclusive education is also to be created among teachers, students without disabilities and their parents.

The inclusive education brings in holistic development to the differently abled students where it improves their psychosocial condition and enhances their quality of life.

Through this study it is evident that the visually impaired students shows positive perception towards inclusive education in the mainstreaming higher

educational institution where the three aspects of availability, accessibility and affordability are in most favourable way.

Conclusion

Thus this study be the pathway for creating and strengthening supportive centres for providing quality inclusive education. This Multimodal Material Preparation Centre be the key factor for providing inclusive education in available, accessible and affordable way. The minority group of differently abled people should have equal opportunities in all the fields of this challenging inclusive society.

Thus this study implicates greater scope for social work practice and further research in this area of Inclusive education which will create a positive inclusive society.

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

Source of Funding: The authors declare that the funding of the study is made by – self and no funding is received from any other sources.

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The Impact of Inclusive Education on Children with Mild Intellectual Disability in Promoting Social Skills and Peer Positive Attitudes in Trichy District

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Abstract

Background: Social skills and social status are important aspects of development that are likely to be influenced by an individual's ability to solve social problems appropriately. An important area of development for children with mild intellectual disability is the development of social skills and social relationships. When children with disabilities are mainstreamed into general education classroom, they learn to play and interact appropriately with children of their own age. Inclusion provides opportunities for socialization and friendships to develop. Inclusion help children with disabilities decrease their aggressive and non complaint behaviour. The study aims to explore the social skills and peer interaction of children with mild intellectual disability which is considered as the most important factors of social outcomes. Finally, the study is objectively proposed to find out how the children with mild intellectual disability self rated themselves as well as the teachers and parents rating of social skills of children with mild intellectual disability in inclusive education programmes.

Materials and Method: In the inclusive education set up, 200 Children with intellectual disability and their teachers, parents and also the children without disability (peers) and their parents in the rural and urban areas of Trichy District were chosen for the study. The data was collected through SOCIAL SKILLS RATING SYSTEM (SSRS)-Gresham & Elliott, 1990). Obtained data were transcribed and analyzed using Descriptive and Differential analysis.

Findings: The statistical procedure showed that children with intellectual disability in inclusive education have average social skills. Since interpersonal contact was associated with positive attitudes towards children with mild intellectual disabled children, interventions should be directed towards promoting interpersonal relationships in order to build an inclusive society.

Conclusion: It is essential to build an inclusive society through an inclusive approach. Success of inclusion demands effective collaboration and meaningful cooperation from all stakeholders associated with education of children.

Key Words: *Social Skills, Inclusive Education, Peer Attitude, Children with mild intellectual disability.*

Introduction

Inclusion is a different way of providing education to all students not just another option in the Special Education Program. It is an approach to education where students with special needs including disabilities are educated in neighborhood schools in age-appropriate regular classroom settings with non-disabled peers.

They are provided with supports and instruction that assures their participation with their peers, while also meeting their individual strengths and needs. The focus is on giving every child the help she /he needs to learn. Inclusion denies the utilization of special schools or classrooms to separate students with disabilities from students without disabilities.

Education is the most prominent means to socialization. The main purposes of elementary education are to develop social skills among children since it is more important as academics. An author ⁽¹⁾ observed that socialization is the child's ability to relate positively to people in society in a manner appropriate to his or her age. Elementary education is the fundamental right. Everyone has the "right to education" states the Universal Declaration of Human Rights (1948). A study ⁽²⁾ found social skills as the cognitive functions use to communicate and interact with each other, both verbally and non-verbally, through gestures, body language and personal appearance.

Children who continuously exhibit social skill deficits experience both short and long term negative consequences and these negative consequences may lead to severe problems later in life. Researchers have indicated that social skill deficits in early childhood are relatively more stable over time related to poor academic performance and may be predictive of social adjustment problems and serious psychopathology in adolescence. Inclusion helps students understand the importance of working together and fosters a sense of tolerance and empathy among the students manifested in most of research.

Materials and Method

Aim of the Study

- To describe the socio demographic background of children with mild intellectual disability.
- To describe the socio demographic background of the teachers of mild intellectual disability.
- To describe the socio demographic background of the parents of mild intellectual disability.
- To describe the socio demographic background of non disabled peers of mild intellectual disability.
- To describe the socio demographic background of the parents of children without disability.
- To study the social skills in mild intellectual disability with regard to cooperation, assertion, self-control, responsibility and empathy.

- To study the problem behaviour in mild intellectual disability with regard to externalizing, internalizing factors.
- To study the academic competence of children with mild intellectual disability.
- To study the attitude of normal children (non-disabled peers) towards children with mild intellectual disability.
- To study the attitude of parents of children without disability towards children with mild intellectual disability.
- To drive a set of guidelines and training booklet for teachers and parents to equip Mild intellectual disability with adequate social skills.

The researcher selected 400 children with mild intellectual disability (200 rural & 200 urban) in inclusive schools of Trichy district by Purposive random sampling technique. 400 regular Teachers and 400 parents of children with intellectual disability have been invited to be the informants in the study. The teachers are teaching 6th, 7th and 8th std in the formal curriculum, as some of them had experience of teaching children with mild intellectual disability in the formal curriculum.

Data collection was done through standardized research tool and self designed Questionnaires to the sample of 400 Mild intellectually disabled children of both urban and rural areas selected by purposive random sampling. Literature survey and analysis of journals helped in determining the suitable tool for data collection. The 400 inclusive teachers and 400 parents of Mild intellectual disability children were also interviewed and administered through standardized tools to get the information and the progress reports of the respondents were also made use of.

The researcher administered the Student form of Social Skill Rating System (SSRF-SF) to the children with mild mental intellectual disability. The researcher interacted with each and every child by explaining the items in Tamil. According to the manual a SRSS rating form typically can be completed in 15-25 minutes; respondents are required to have at minimum grade three reading level. Out of 400 children, 68.5% of children

with mild intellectual disability studying in 7th and 8th need some assistance in reading and understanding the item, 31.5% of (studying in 6th std) children need full assistance where the researcher interacted with every child and collected their responses. So, it took 30-45 minutes to complete the rating scale.

The regular teachers who are handling the children with mild intellectual disability completed the Teacher form of Social Skill Rating System (SSRF-TF) in classroom by assessing the social skills of each student separately. The parents of mild intellectual disability completed the Parent form of Social Skill Rating System (SSRF-PF).

The SSRS assesses children's positive social skills, using a 30-item scale for teachers, and a 39-item scale for parents. Parents and teachers rated the frequency with which children displayed positive social behaviors at home and at school, respectively (e.g., "makes friends

easily" and "volunteers to help peers with classroom tasks") on a 3-point Likert scale ("never", "sometimes", or "often").

Results and Discussion

The table-1 reveals the overall mean, standard deviation and ranges of children, teacher and parent SSRS ratings of social skills, problem behaviour and academic competence of 400 mild intellectually disabled children. In all the subscales cooperation, assertion and self-control teacher rated significantly higher than the parents. This is because majority of the respondents (teachers) had increased experience of teaching in inclusive classroom and basic knowledge about children with disability especially intellectually disabled children. It is also clear that teachers in the inclusive classroom have a broader understanding on the overall social skills of children with mild intellectual disability.

Table -1: Descriptive Analysis Between Social Skills

Sub Scale	Parent	Teacher	Children
Co operation	9.66(4.38)	10.34(4.43)	9.75(4.76)
Assertion	9.44(4.10)	10.09(4.43)	9.56(4.36)
Empathy	--	--	9.70(4.92)
Self control	9.35(4.12)	10.44(4.56)	8.92(4.68)
Responsibility	9.91(4.16)	---	--
Overall Social Skills	38.36(15.249)	29.67(12.668)	
Problem behaviour Externalizing	5.41(2.50)	4.82(2.82)	--
Problem behaviour Internalizing	5.24(2.25)	4.74(2.83)	--
Overall Behaviour	10.65(4.292)	9.61(5.352)	--
Academic Competence		21.01(7.60)	--

Means and Standard Deviations of SSRS for 400 children with Mild Intellectual Disabled

A Study⁽³⁾, Differences between teacher and parent rating on cooperation, assertion, self –control and responsibility of social skills can be interpret as because parents and teachers observe different aspects of the child’s behaviour, it is reasonable that their information is not equal ,but can be seen as completing . Parents’ reports, in fact, may improve and deepen a teachers’ understanding of a child.

The respondents (children with intellectual disability) rated themselves higher on the subscales cooperation, assertion than the parents and teachers rating. In the self-control subscale items like ignore other children when they tease, disagree with adults without fighting or arguing, accept punishment from adults, controlling the temper when people are angry etc .The children rated themselves lesser than the parents. But the teachers rated higher the self control subscale items politely refuses unreasonable requests from others, responds appropriately to teasing ,when hit or pushed by other children ,speaks in an appropriate tone or voice at home of their children with intellectual disability. This difference in rating is due to the children sees themselves lower in mingling with their peers.

An author⁽⁴⁾The peers in school, being the closet on par, play an important role in the lives of children with disabilities. Acceptance by peers provides a much greater challenge for children with disabilities. Children with disabilities are often an easy target for being teased and bullied by their non –disabled peers. The children commonly reflected that they wanted to be accepted and have more friends in the class who understand them and involve them in their talks and play.

The parents sees their children with intellectual disability have higher responsibility on subscale items like shows concern for friends and relatives of his/her own, follow household rules, informs you before going out with friends, say nice things about himself/herself etc higher .

This is due to Parents’ ratings provide a wider range of information, because they observe their children in a variety of settings across a long period of time. At times, however parents are not familiar with the purpose of the assessment and also may not have experience with various types of deviant behaviors.

The children with intellectual disability rated themselves higher in the empathy subscale includes items like say nice things to others, ask friends for help, smile, wave and nod at others, tell other people when they have done something well etc.

Research suggests that there is an important link between student social skill development and academic development. In a study found that⁽⁵⁾Children’s academic skill development and their social skill development often are closely related. Research has demonstrated that social behaviors in the classroom predict academic achievement have found that most children who have social adjustment problems also experience problems in academic areas, such as reading skills⁽⁶⁾.Students with higher social functioning exhibit less problem behaviors in the classroom and more academic competence.

Discussion

The objectives of this study were to analyze the social skills strength, deficit and acquisition among children with mild intellectual disabled in inclusive education. The study also aims to study the attitude of the peers and parents of children without disability towards children with mild intellectual disabled.

Based on the findings of the research the children with mild intellectual disability are lagging behind their normal peers when building social skills. There are several steps that can be taken to ensure students with special needs are offered an opportunity to create social interactions with peers. The regular teacher has to play an interactive role in order to promote social inclusion.

Research has also found that inclusive education practice has a positive contribution on students’ peer relations and social skills .When provided with inclusive education during the early years of their life, children are likely to have shared interactions with peers and adults. This promotes growth, the positive change, and their desire to learn. “Children become open to learning and change, and with their flexible point of view they are able to empathize with their peers have special educational needs, they develop tolerance and understanding towards their peers with special educational needs during inclusion”.

Ethical Clearance: This study was undertaken

with the consent from the participating children, their teachers and families. The children with mild intellectual disabilities were the main respondents for the study. The institutional research and review body explicitly approved the conduct of this research.

Source of Funding- Self

Conflict of Interest –NIL

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COVID-19 as a Conscious Organism: A Novel Understanding of the SARS-CoV-2 as a Natural Evolution of the SARS Virus

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Abstract

The RNA virus SARS-COV-2 that has led to the outbreak of the worst ever pandemic has one particular enhanced virulence factor, the spike protein in the Receptor Binding Domain (RBD). We discuss its evolution from earlier strains of respiratory infection causing viruses in terms of increased incubation period and symptomatic width. We propose that any disease can be considered as an evolving conscious organism having its own teleological evolutionary pathway, the pathogens, vectors and hosts being merely the vehicles of its transmission, and not its causes. In this perspective even if it is the result of some sinister design by genetic modification in laboratory, it still can be considered as its natural evolution only, in which the scientists themselves became its extended evolution and transmission vehicles, which made it defy the existing medical knowledge, methods, resources and efforts. In an expanded scheme the pathogens like SARS COV-2 are to be considered as predator species for their human hosts. We conclude that only with conscious awareness of expression of emotions keeping reasonable restrictions on oneself mankind can ever hope to address such pandemics.

Key words: COVID-19, SARS-CoV-2, SARS, virulence enhancement, consciousness, teleological natural evolution.

Introduction

There has been an ongoing debate on whether the SARS-CoV-2 was a bioengineered product of a biological weapons development laboratory in Wuhan, China or whether it was a natural evolution from the earlier strain SARS virus^[1]. The common characteristic that grants the family of coronaviruses their lethality is their being RNA viruses. They specialize in attaching to the host cell's ribosome to replicate without any need for

penetrating into the mitochondria or nucleus. We propose that even if it is a bioengineered product it can still be seen as a product of natural evolution. The question that we pose is: Of all the viral strains available, why did the researchers fall for the SARS virus for engineering? The SARS virus itself was not bioengineered by researchers but had highly developed, naturally endowed virulence factors. This points to some deeper underlying truths about diseases and their appearance as part of natural evolution.

Table:1: Progressive width and severity of symptoms from respiratory viral infections

Sl. No.	Disease	Symptoms	Incubation period
1	Allergy	Dry cough and Sneezing	1 sec -- 24 hrs
2	Common Cold	Cough with mucous, Sneezing and Nasal discharge	1 -- 3 days
3	Flu	Cough with mucous, Sneezing, Nasal discharge, Body ache, Fatigue and Low fever	1-- 4 days

Cont... Table:1: Progressive width and severity of symptoms from respiratory viral infections

4	Swine flu (H1N1)	Fever, cough, sore throat, chills, body ache	1-7 days
5	Avian flu(H5N1)	Cough, fever, sore throat, headache, muscle pains, shortness of breath	2-8days
6	SARS	High fever, chills, headache, pneumonia, hypoxia	2-10 days
7	COVID -19	Dry cough, Sneezing, Sore throat, Body pain, Fatigue, Oppressed breathing and High fever	1—14 days

Table 2: Pathogenic genus of the Corona viruses, Hosts and symptoms

Sl.No	Genus	Host	Symptoms
1.	Alpha	Human	Mild respiratory tract infection
		Pig	Mild respiratory tract infection, Diarrhoea, Vomiting
		Dog	Diarrhoea
		Camel	Asymptomatic
		Cat	Fever and Serositis
2.	Beta	Human	Pneumonia, Mild respiratory infection, Severe acute respiratory syndrome
		Cow	Diarrhoea
		Horse	Fever, anorexia
		Mouse	Pneumonia and Severe Lung injuries
3.	Gamma	Whale	Pulmonary disease, Acute liver failure
		Chicken	Severe respiratory disease
4.	Delta	Bulbul	Respiratory disease
		Sparrow	

It is clear from Tables-1 and 2 that SARS-CoV-2 is a mutation of SARS virus to enhance incubation period and the capacity to create fluid accumulation in alveolar edema leading hypoxia.

Action of Hydroxychloroquine on SARS CoV-2

In order to penetrate cells by membrane fusion and uncoating the SARS COV-2 requires its surface spike proteins to be activated by lysosomal proteases which attach to the angiotensin converting enzyme 2 (ACE-2) receptors in the outer tissue layers of lungs, heart, kidneys and intestines of humans. Hydroxychloroquine used as an antiporozoan in malaria treatment is weakly basic in character which increases the pH of

the endolysosome thereby inactivating the lysosomal proteases. This is how Hydroxychloroquine proves beneficial in treatment of COVID-19.

We take the example of malaria as an epidemic to bring into focus certain hitherto unexplored and unthought of aspects of diseases.

Malaria as a typical example

In case of malaria, does the Plasmodium parasite consciously work on the vector to instruct it to transmit the sporozoite into the human bloodstream so that its lifecycle can be completed^[2]? Does the mosquito vector get some release by transmitting sporozoites into the human bloodstream from its salivary apparatus^[3]?

The human being tries its best not to get infected with malaria and struggles hard by taking all precautions not to be bitten by the mosquito. The vector undergoes great struggle in its physiological and biochemical level to carry sporozoite and the vector struggles hard to evade the parasite growth in its body^[4]. And finally, the parasite must not have wished to follow such a complicated life cycle to complete its process of multiplication. Thus in this whole cycle, the Parasite, the Vector and the host are all consciously engaged in evading the whole process. Still, the process continues to occur in a very systematic manner and thus ensures:

1. The successful reproductive fitness of the parasite.
2. Vectorial capacity in the mosquito vector with assured sporozoite transmission.
3. The successful proliferation of “malaria” as if it were a conscious being.

Our view of an organism as a physiological unit is rather restrictive in its scope and content and we need to cross that barrier to better appreciate the existence and evolution of diseases alongside that of species. We don't as yet have any understanding of what makes an organism an organism: that is, how does an organism behave as a coordinated whole with lot of autonomous processes incessantly going on to maintain and sustain itself as such, without its conscious agency? We have, in earlier works, proposed about the organism being essentially a set of psychic impressions beyond space-time, which awaken to become instincts and then get activated as urges leading to manifestation in the physical plane as the morphological structure of the organism^[5-7]. In the psychic dimension, therefore, the disease can exist in a progressively grosser form as a set of impressions or instincts or urges, in that order, which have been necessitated by certain past experiences stored in the memory of certain species as essential ingredients of their existence and evolution. Such a set of impressions/instincts/urges is itself recognizable as the subtle form of the disease-organism and as a precursor to the appearance of the corresponding organisms as its pathogenic vehicles with their continuously evolving pathogenicity.

Disease as a conscious being

We find that even with so much of scientific and technological advancement, the most aware and technology-enabled human is not yet able to get rid of malaria. Whatever precaution one may take, all the ideas fail when we confront the fact that a ‘single bite of the infected vector can cause malaria in the human’. And, the human being therefore, cannot avoid being infected. It clearly indicates that the conscious mechanism that plays a role in the form of ‘**malarial disease**’ is teleological and the whole design is due to conscious mechanism of the disease-organism called ‘**MALARIA**’, which succeeds to manifest finally without fail^[5]. The struggle in all the three levels of the parasite, the vector and the host is seemingly conscious too, as it is designed by the final unfailing conscious mechanism of the teleological evolution^[8].

Similarly, the modes of pathogenic transmission through very fundamental, normal and unavoidable survival modes such as respiration or intake of food and drink point to the fact of there being a tremendously intelligent design by the disease-organism to spread unfaithfully. The SARS-CoV-2, for example, has a dangerously high rate of spread by modes of mutual contact, inhalation or ingestion to other individuals from a single infected individual. It spread more dangerously faster than the proverbial *wildfire* to infect whole continents! Risk factor for it is far more than any other pandemic in known human history.

The first necessity for the existence of such pandemic generating pathogens is as population regulators since they perform the role of predators for the species they prey upon or infect. The exact mode of transmission has to be unfailing to ensure their functional success. Evolutionary mechanisms come into full play once the tussle between the host-prey and the disease-predator starts and at the physiological level it appears as the ever-evolving war between the disease-transmitting pathogens and the antibodies generated in the host-system^[9].

Endemic or Pandemic- Virulence Enhancement is the goal

The pathogens such as viruses and bacteria, the vectors such as mosquitoes, bats, pangolins, humans etc.

are merely the vehicles of transmission of the disease and not the causes thereof. A disease in the form of an endemic can be seen as the subtler form of an organism which is manifest through the network of Parasite, Vector and Host with the sole purpose of spreading to ever larger dimensions with much stronger virulence factors. The urge to spread by infection and transmission appears as the viral genome with ever evolving virulence factors. This perspective is applicable to all viral and bacterial epidemics and can help us understand them at a deeper level and enable us to develop effective mechanisms against them. One particular virulence factor, the spike protein in the Receptor Binding Domain (RBD) became more potently manifest in the SARS-CoV-2 causing the worst ever pandemic COVID-19^[1]. The increased virulence seen here is same as with other pathogens, whether it is drug resistance in the pathogen, insecticide resistance in vector and immunoglobulins or antibodies in the host. They are for their conscious evolutionary advantages only^[10, 11]. Re-emergence of the importance of Chloroquine drug which was stopped to be employed for malaria intervention due to Plasmodium drug resistance for around a decade, is also to be taken into account as its conscious evolution to re-materialize as a chemotherapeutic agent of further more crucial importance and it was well anticipated too^[12]. Similarly, in case of cancer, nature selects some cells that can develop aggression and resistance as the vehicles of the transmission and manifestation of the oncovirus^[13,14,15,16,17].

Conclusion

Our proposal indicates several levels of tackling the phenomenon of diseases, starting from the core psychic domain to the level of chemical interventions or medicines as a therapeutic strategy. Certain undesirable habits of instinctive mutual contact among individuals which in case of humans is inherited, imposed and practiced by way of modes of greeting or other conformatory socio-cultural norms. It is through these contacts that the pandemic like COVID-19 has spread so fast and so successfully. There are many other lessons to be learnt following this line of approach that we have advocated here.

Implications for Human Evolution:

We have recently proposed the viral origins of life, its

evolution and ultimate dissolution through *The Cancer Principle*^[13,14,15,16,17]. SARS CoV 2 being an RNA virus predates the known onco viruses (DNA viruses and has emerged as a predator for humans vindicating our proposal of ubiquitousness of Prey Predator Relationship in nature⁹. From this point we as a species have only two possibilities of evolution; (1). We may develop antibodies naturally or artificially through vaccination against such viruses. (2). If we fail to develop antibodies then it will be a permanent acceptance of such pandemic viruses as the predator species for humans. The first alternative will lead to competitive evolution while the second is some kind of capping on evolution^[18].

The researchers who fell into the trap of developing it further into the SARS virus were obviously prey to such enticing and intensifiable virulence factors available in it. The SARS virus, the researchers, the funding agencies all together form components of the widespread virulence enhancement network of the SARS virus. Therefore, seen in this perspective, SARS-Cov-2, even if it is a bioengineered product, is apt to be called a natural evolution of the SARS virus^[19]. If HIV warned mankind on unrestrained expression of passion, SARS CoV-2 has cautioned us on unrestrained expression of emotion. Seen from this angle, it has deeper penetration than HIV to the inner layer of emotion that often is a precursor to the expression of passion. One may wonder, what will be the next evolution of virulence and to which unavoidable mode of transmission it will adapt. As of now, medical science is completely undone, with only one choice of control of the spread of COVID 19 - 'to be conscious'. We have to be eternally vigilant to be safe from infection. Social distancing has to be the order of the day everywhere and for all times and for everyone. It is not that we were unaware of viral and bacterial transmission of infections through contact. Still because of the treatability low risk factors associated, we could take the liberty of continuing with our old ways and habits of unrestricted mutual contact and sharing and what not. Now we have to be cautious and conscious every moment of our interaction with others keeping in mind the increased severity and the risk factors of COVID-19.

Diseases can be somewhat broadly classified as per their occurrence and endemicity in different sections of human society. For example most of the life style

diseases (LSD) such as diabetes, obesity, High BP, hypertension etc. are mostly diseases of the rich and the affluent, while the diseases such as low BP, hepatic, pulmonary and enteric diseases are mostly characteristic of the poor. HIV-AIDS and COVID-19 are diseases of the unaware or unconscious lot and tend to point out to humanity its dangerous ways of social culture. A pandemic of such order has certainly great lessons for raising the consciousness level of humanity, even if we succeed in eventually dealing with it effectively through vaccination or medication. Truly, nothing in science makes sense except in the light of 'consciousness'^[20].

Ethical Clearance- Not needed for this kind of study

Source of Funding- Self

Conflict of Interest-NIL

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Knowledge, Awareness and Attitudes About Hepatitis B Infection and Its Vaccine among Health Care Workers at a Tertiary Care Centre in Eastern India

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Abstract

Background: Hepatitis B virus (HBV) infection is a major health problem worldwide. The aim was to assess the knowledge, awareness and attitudes about HBV infection and its vaccine among HCWs at a tertiary care centre in eastern India.

Method: The study was carried out among 210 numbers of randomly selected HCWs of IMS and SUM Hospital. Answer to questionnaire about different aspects of HBV infection and its vaccine were assessed.

Results: Majority of the participants were females (90%) and within the age group 15-25. A large majority (> 95 %) of the participants were aware of HBV infection and vaccination and all these persons have been vaccinated against HBV. Most of the health care workers (> 90 %) were aware that hepatitis B spread through infected blood, infected razors and vertical transmission. When asked that if one is vaccinated against HBV & gets a needle prick injury, only 5% correctly said that nothing needs to be done if one is adequately vaccinated. When asked if one is not vaccinated & gets needle prick from a HBV infected person, then majority (89 %) of the HCWs said one need to take HBV immunoglobulin alone. The participants had another question which was whether there is the need for booster dose after completion of vaccination, only 37% of the HCWs correctly.

Conclusion: There is very good awareness and knowledge regarding HBV infection and its vaccine among the HCWs. This is probably due the practice of universal and free vaccination that the hospital follows.

Keywords: - HBV, KAP, HCW, Community Practice, Vaccination, Needle Prick

Introduction

Hepatitis B virus (HBV) can cause chronic hepatitis which can lead to cirrhosis of liver and hepatocellular malignancy and liver failure in a significant number of patients.¹ Worldwide, approximately 2 billion people have been infected with HBV.² India lies in the intermediate endemic zone, the prevalence of the virus being around 2-8%.³ HBV is 50–100 times more infectious than HIV.⁴ The HBV is present in high concentration in blood, serum, saliva, semen, vaginal fluid and most of body fluids. Vertical transmission from mothers to neonates, transmission through unsafe sex, unsafe injections and body fluids like blood remains the

most common route of infection for hepatitis B virus.^{5,6} Another important route of entry includes accidental inoculation of minute quantities of blood during the surgical and dental procedures.⁶ Health care workers (HCWs) are at high risk for HBV infection as compared to normal population. Various studies have shown that HCWs had a prevalence of HBV infection approximately 10 times greater than the general population.⁶ HCWs do not recognize all exposures to potentially infectious blood or body fluids. Few studies published from India have shown that the awareness of HBV infection and its vaccine in the community is believed to be very poor.⁷ The objective of the study was to assess the knowledge,

awareness and attitudes about HBV infection and its vaccine among HCWs at a tertiary care centre in Eastern India.

Materials and Method

This was a cross sectional study which was conducted at a medical college, IMS and SUM hospital, Bhubaneswar during the month of November 2018. Two hundred ten health care workers (HCWs) of the hospital were randomly selected and included in the study. These health care workers were mostly nurses, pharmacists and laboratory physicians. Doctors and students were excluded. The age, gender and qualifications of the HCWs were noted. All these HCWs were subjected to a predesigned questionnaire [containing 15 questions] on hepatitis B infection and its vaccine (Image 1). Verbal informed consent was obtained from the participants and strict confidentiality maintained.

HCWs, who had a history of HBV infection, unlikely to come in contact with blood/body fluid, and those who did not agree to participate were excluded from the study. Effectively vaccinated subjects were defined as those who had received three doses of hepatitis B vaccine according to the schedule (0, 1 and 6 months).

Results

Two hundred ten randomly selected HCWs were included in the study. Majority of the participants were females (90%) and within the age group ¹⁵⁻²⁵. All the 210 (100%) selected HCWs were aware of hepatitis B infection. A good number of the health care workers (97%) were aware of Hepatitis B vaccine. When these health care workers were inquired regarding the source of awareness for HBV infection, most of the participants (76%) said that it is because of medical training and 21% of the participants knew about HBV infection from mass media communication (television and radio). When

asked about the route of HBV spread, a large number of participants (95 %) said that HBV infection can spread through infected blood and most (93%) of the participants identified correctly that HBV can spread through infected razors. A good number of participants (88%) identified that HBV infection can have vertical transmission from mother to fetus. Almost everyone (97%) were aware that HBV can affect the liver. About 2/3rd of the participants (63%) correctly said that the virus can lead to acute liver failure, cirrhosis and hepatocellular carcinoma. According to the present survey, most (88%) participants said that HBV infected patients can lead normal life with family members. When asked what percentage of acute HBV infection spontaneously resolves in adults, the opinion was divided among the participants. One third (35%) said that the infection can resolve in only 20 % of cases; while only 16% said that acute hepatitis B spontaneously resolves in more than 90 % of adults. The HCWs were then inquired regarding the post exposure prophylaxis (PEP) following needle stick injury with an infected patient. When asked that if one is vaccinated against HBV & gets a needle prick injury, 52% of the participants said that HBV immunoglobulin needs to be given, 38% said vaccination is required and 5 % said anti-viral drugs needs to be started. Only 5% said that nothing needs to be done as PEP if one is adequately vaccinated. When asked if one is not vaccinated & gets needle prick from a HBV infected person, then majority (89 %) of the HCWs said one need to take Hb immunoglobulin. The participants had another question which was whether there is the need for booster dose after completion of vaccination, 74(37%) correctly said that there was no need of taking booster dose again, while a similar percentage (36%) said that there is a need of booster dose after five years. When asked about vaccination status, around 188(94%) of the participants replied that they were effectively vaccinated while the rest did not.

Image 1 – Questionnaire for HBV awareness

Questionnaire for the study -

1. Are you aware about Hepatitis B (HBV) infection?
Yes No
2. Hep-B can be prevented through the following?
Vaccine, Tablets. Not preventable, Universal precautions.
3. Are you aware regarding Hepatitis B Vaccination?
Yes No
4. Source of awareness?
Reading Newspaper, b. Watching TV c. Listening to radio, d. Medical training.
5. How Can HBV spread among relatives by sharing?
Utensils, Razor, Bed linens, Comb Touching
6. If one who is adequately vaccinated gets pricked needle one should go for?
Vaccine. Hb immunoglobulin. Drugs. None.
7. One who is not vaccinated & gets needle prick from a positive (+) person then one needs to take?
Only Vaccine. Hb immunoglobulin + Vaccine. Drugs. None.
8. Which organ will be affected in HBV infection?
Pancreas. Liver Kidney. Stomach.
9. Through which HBV infection spread from one person to another?
Blood Sneeze Water Street food.
10. Is that need for Booster dose after complete of vaccination?
5years. 2years. Not needed. Once a time.
11. Can HBV infection spread from mother to fetus & Newborn?
Yes . No.
12. HBV infection results in
a. Cirrhosis. b. Liver cancer. c. Acute liver failure. D. All of the above.
13. Acute HBV infection in adult spontaneously resolves in _____ % of patient?
85%. 90%. 20%. 95%.
14. Can a Hepatitis B patient lead a normal life with his/her family member?
Yes No
15. Are you vaccinated?
Yes No

Table 1: Comparison of studies from various parts of the world regarding HBV awareness among health care workers and others

Region	Authors	Number	Types	Whether aware of HBV?	Whether aware of HBV vaccination	Whether vaccinated?
United Kingdom	Ogden et al8	649+224	Medical and dental students		99.2%	99%
Saudi Arabia	Paul T et al9	126	Dentists	100%	100%	85.7%

Cont... Table 1: Comparison of studies from various parts of the world regarding HBV awareness among health care workers and others

India	Sukriti et al10	2162	HCWs	~	~	55%
Malaysia	Yaacob HB et al11	730	Dentists	~	73%	32%
Ethopia	Habtemu J. H et al12	240	HCWs	74%	90.4%	~
Syria	Ibrahim N et al13	128	Medical students	92%	~	43.7%
Pakistan	Rafiq ali Et al14	500	Non medical students	~	67.8%	50%
India	Setia S et al15	255	Interns(dental, medical and nursing)	100%	87.3%	88%
India	Rakesh S et al16	100	Doctors, nurses, lab technicians	~	~	67%
India	Rajiv S et al17	150	Dentists	73%	94%	70%
India	Rathi et al18	161	Medical students(1st&2nd year)	~	96%	40%
Present study		210	Nurses and pharmacists	100%	97%	97%

Discussion

It was seen that most of the participants were females, with male: female ratio of 9:1. This is because most of the participants were nurses and lady pharmacists. In the present study, it was observed that 100% staffs are aware of Hepatitis B virus and 97% were aware of Hepatitis-B vaccination. Table 1 shows the various studies done from different parts of the world and also from India done on the knowledge and awareness about the virus and its vaccine among health care workers.⁸⁻¹⁸ This study has included only the nurses and pharmacists. Still surprisingly the awareness about HBV infection and its vaccine is almost 100%. This is probably due to the fact that the hospital follows an universal and free vaccination against hepatitis B. In fact when these HCWs were asked regarding the source of knowledge, majority replied they were taught about HBV during their medical training and also during time of vaccination. Similar favourable

and 100 percent results have been seen among medical and dental students of Dungee, United Kingdom.⁸ The policy of that college also calls for universal vaccination. There are various KAP studies from India on medical students, doctors and dentist regarding hepatitis B and its vaccination. [Table 1] A study from Odisha, albeit done two decades back, has shown that the vaccination status was abysmal 2% among nursing students while it is comparatively higher among medical and dental students (~ 80 %) ¹⁹ A study from northern India showed that only 56% of the HCWs were adequately vaccinated.¹⁰ Another study from Chhattisgarh showed that both awareness and vaccination status among the first year students is very low (only 18% are vaccinated). However the awareness and vaccination status increases among the final year year students.²⁰

Previous studies have shown that HBV infected patients are discriminated, just like HIV patients, not only by health care providers but also family members.²¹ However in this study, it is commendable that around 90 % of the HCWs agree that these HBV patients can lead a normal life with his family members and that the infection does not spread by touching or eating together. Similarly around 90% of the health workers know that HBV infection can have vertical transmission from mother to child. This study shows that there is some ignorance and confusion regarding post exposure prophylaxis (PEP) against hepatitis B and regarding the need for booster dose. The good thing that the study illustrates is that most of the health care workers have heard of HBV immunoglobulin and vaccine as PEP. The study also shows that the most of the health care workers are not aware that there is no need of a booster dose of HBV vaccine.

There are few limitations of the study. Only a randomly selected 210 HCWs were enrolled in the study, whose opinion may not represent the whole community as a whole. Second limitation is that the all the information was self-reported which may not reflect accurate knowledge.

Conclusion

Almost 95 % were vaccinated adequately against HBV infection and this practise of free and universal vaccination at the hospital is the probably the reason of very high awareness about HBV infection among the HCWs. There is also good knowledge regarding different aspects of HBV infection.

Ethical Clearance taken from Institutional Ethical committee, IMS & SUM Hospital SOA University, Bhubaneswar.

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Systematic Review on Quality of Life among Migraine Sufferers

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Abstract

Migraine is a neurologic disorder characterized by a cycle of attacks, including headache, separated by attack-free periods. Increasingly, episodic migraine is recognized as a disorder that may escalate to chronic migraine, with a frequency of 15 or more attacks per month. Migraine exacts a toll on the quality of life (QoL) of affected individuals, their families, and their workplace. The objectives of the study were to review the related studies and to understand the evidences regarding the quality of life among migraine sufferers. This article presents the review of literature relating to the studies carried out by various researchers in the area of quality of life among patients with migraine.

Keywords: *Quality of life , Migraine, sufferers*

Introduction

Migraine is a neurologic disorder characterized by a cycle of attacks, including headache, separated by attack-free periods. Increasingly, episodic migraine is recognized as a disorder that may escalate to chronic migraine, with a frequency of 15 or more attacks per month. Migraine exacts a toll on the quality of life (QoL) of affected individuals, their families, and their workplace. Migraine adversely affects a patient's QoL during an attack, but also has an impact between attacks. This burden on the patient manifests itself as worry in anticipation of the next painful attack and concern over its possible adverse impact on future plans or activities. The high prevalence of migraine, 12% in industrialized countries and approximately 28 million people in the United States, is considered a low estimate. Patients with disruptive migraines frequently overuse self-prescribed medications or may postpone a visit to a physician, which

delays accurate diagnosis and appropriate treatment for migraine. An extensive literature search of migraine reviewed its associated disability and reduced QoL during, and especially between, attacks. Nevertheless, patients with frequent and recurring migraines, who suffer a reduced QoL, continue to be under recognized and undertreated.¹

Aim of the Review: The aim of the this study was to identify the evidences on quality of life among migraine sufferers.

Objectives of the Review

- To review the related studies regarding the quality of life among migraine sufferers
- To understand the evidences of on quality of life among migraine sufferers

Materials and Method

Quantitative approach and descriptive design was used for this review. The need for the study was identified , the review was done by using different search strategies , adopting the interfaces and databases .The collected data was noted for clarity and used in this study.

Eligibility Criteria: The review was done to identify the relevant articles that describe the quality of

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life among migraine sufferers.

Inclusion Criteria:

- Studies related to assessment of quality of life among migraine sufferers
- Literatures published in English language
- Literatures published in the year 2013-2018

Exclusion Criteria:

- Studies with inadequate information on the research methodology
- Studies related to the effectiveness of intervention on quality of life among patients with migraine

Literature Search Strategies and Data Source

To gain an understanding regarding the quality of life among migraine sufferers, the author performed a systematic search of literature mainly from electronic databases such as MEDLINE, Pubmed, EBSCO Host, Science Direct, Wiley Online Library, CINAHL, Google Scholar. The review was restricted from 2013 to 2018. Reviews were mainly collected by using the following keywords; quality of life & Migraine .

Data Analysis

The data analysis comprised of three stages;

- Developing a preliminary synthesis of studies
- Exploring the studies based on the various objectives
- Summarizing the findings: The following data were extracted and tabulated as Author, year of publication, methodology, instruments/ techniques, sample size, setting, tool utilized and major findings

Results

The articles included in the review were published in the time period of 2013-2018, which are discussed as follows:

The study conducted by **Kartavya Sharma, etal²**, 2013 among newly diagnosed migraine patients in Headache clinic of a tertiary referral center. The

findings revealed that Migraineurs were significantly impaired in all subscales of the SF-36 compared to controls, with greatest impairments in role physical, general health, and role emotional subscales. Prevalence of clinically significant anxiety (48%) and depressive (41%) symptoms in patients was higher than in healthy controls. HRQoL is significantly reduced in Indian migraine patients compared to healthy controls. The study done by **Raggi A ,etal³** 2013 , revealed that, migraine frequency and intensity were almost stable over 3 months, and an evident trend toward improvement was found in disability and in some health-related quality of life aspects, particularly in the social activity domain. Our results clearly indicate that continuity of care has a positive impact on patients' health status and functioning, also in stable patients already on anti-migraine therapy, and that the use of patient-oriented outcome measures is a viable way to capture such improvements.

Sulmaz Ghahramani, etal⁴ 2014 studied 100 Patients with migraine treated with both propranolol and topiramate. the results showed that, after treatment, the highest score belonged to physical problem and the lowest one was emotional problem. Men had significantly higher scores in body pain compared to women (P = 0.039). Combined migraine prophylaxis with propranolol and topiramate improved HRQOL in migraine sufferers in this study. Another study by **Kim SY, Park SP⁵**, 2014 evaluated the contribution of headache chronicity to QOL in relation to clinical, psychiatric, and psychosocial variables in patients with migraine. Among 251 eligible patients, 183 (72.9%) had episodic migraine (EM) and 68 (27.1%) had chronic migraine (CM). Patients with CM had more serious clinical, psychiatric, and poor QOL than did patients with EM. Chronic migraine appears to impair QOL directly as well as indirectly by provoking disability and depression.

Shaik MM, etal⁶ , 2015, conducted a study to measure QOL among migraine sufferers in comparison with healthy controls. Females with migraines had significantly lower total WHOQOL-BREF scores than did healthy controls . Similarly, physical health and psychological health scores were significantly lower than those for healthy controls. The present study showed that migraine sufferers experienced significantly lower QOL than the control group from a similar population.

Cha MJ⁷, 2017, conducted a study among 186 CM patients. The stress group had more patients with poor outcomes of acute treatment than the reference group. High levels of stress were reported by 42.5% of patients with CM. Another study by **Al-Hashel JY**⁸, 2017 aimed to measure the prevalence of migraine and to assess its burden in Kuwait. A total of 15,523 subjects were identified; of whom 3588 (23%) were diagnosed as episodic migraine and 845 (5.4%) as chronic headache. Prevalence of episodic migraine was 31.71% in female versus 14.88% in males ($P < 0.01$) with a mean age of 34.56 ± 10.17 years. Migraine in Kuwait is highly prevalent and it has a significant impact on activity of daily living, schooling/employment and social occasions of patients. Accurate diagnosis, effective abortive and preventive treatments of migraine are paramount to improve quality of life and as well as cost saving.

Sumit Singh, etal⁹, 2017 done a study among 705 Migraine patients in 10 Centres. They used HRQoL using Migraine Specific Quality of life (MSQ) and Migraine Disability Assessment Scores (MIDAS) questionnaire. Hypertension (7.0%) was the highest comorbid illness associated with migraine. Majority of patients had pulsating, bilateral attacks for the duration of 4h to 72 h. Paracetamol (47.1%) and propranolol (50.9%) was most commonly prescribed drugs for acute attack and prophylaxis, respectively. Cardiovascular diseases, diabetes mellitus and anxiety were common comorbidities associated with migraine.

Benz T etal¹⁰, 2017, conducted a pilot study and found that moderate to high levels of pain and self-reported disability owing to headache were observed, whereas physical function on the SF-36 was not different from the expected level of the norm. Mental health was substantially affected in several dimensions, which had been described to reduce the ability to cope with pain. MOH patients seem to have high expectations of functionality, low symptomatology, and intact well-being.

Hanson LL, etal¹¹, 2018, reported that Visual quality of life is significantly adversely affected in migraine sufferers. In fact, patients with chronic migraine may have visual quality of life impacts that are as significant as those associated with other common neuro-ophthalmic disorders. Future studies of the overall

disease burden in patients with migraine should include an evaluation of the effects on visual functioning.

Discussion

The total review articles included in the study are 10, in time period of 2013-2018. The methodology utilized was cross-sectional quantitative survey in most of the studies (8 out of 10), one was longitudinal observational study with a 3-month follow-up and 2 was Interventional study. Participants were recruited from different settings, including headache clinic (6), hospitals (2), headache program (2). The samples of the study were patients with migraine. Majority of the subjects were diagnosed by Short Form-36, Migraine Disability Assessment Score, World Health Organization Disability Assessment Schedule, second version, Migraine-Specific Quality of Life (MSQoL), Malay version of the World Health Organization QOL Brief (WHOQOL-BREF) questionnaire. Studies were done in various countries across the world which includes Germany, Italy, India, USA, Kuwait, Korea(2), Malaysia, Iran. Sample size in all studies varied from 71 to 4433. The results of all studies showed that, quality of life was significantly reduced in migraine patients.

Conclusion

The present study showed that migraine sufferers experienced significantly lower QOL. Clinically significant association was found with migraine and anxiety and depressive symptoms. Accurate diagnosis and preventive measures for migraine are very important to improve quality of life of migraine sufferers.

Limitations

- Most of the studies were from foreign countries
- Only 10 studies were taken for this review

Conflicts of Interest: Nil

Source of Funding: Self Funded

Ethical Consideration: The research title was approved by research committee of SRM college of Nursing, SRM IST, Kattankulathur, Kancheepuram district.

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Protective Role of Royal Jelly and Honey against Cisplatin Induced Sperm Function Parameters in Male Rats

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Abstract

Background: Cisplatin is one of the cytotoxic agents in the treatment of cancer and has side effects on sperm function.

Objective: This study aims to investigate the ameliorative role of dietary bee honey and royal jelly against *cisplatin*-induced alterations in sperm function parameters in male wistar albino rat.

Methods: Male wistar albino rats of same age and weight were randomly divided into four groups; G, I: control group which was given 0.9% saline, G: II: *cisplatin* (7 mg/kg/d) was injected intraperitoneally for 15 d, G, III bee honey with royal jelly (500 mg/kg/d of honey and 100 mg/kg/d of royal jelly) fed orally daily for 15 d, G, IV: *cisplatin* (7 mg/kg/d) was injected intraperitoneally and honey (500 mg/kg/d) and royal Jelly (100 mg/kg/d) fed orally daily for 15 d. The sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis were measured by using a hemocytometer under the microscope at 100X magnification.

Results: *Cisplatin* treated rats revealed a significant decrease in sperm count, sperm viability, sperm motility, weight of epididymis and testis as compared to control group. Royal jelly and honey treated group of rats revealed a significant increase in all sperm function parameters compared to control group. Dietary bee honey with royal jelly along with *cisplatin*-treated rats revealed significant increase as compared to animals treated with *cisplatin* (G, II).

Conclusion: Bee honey and royal jelly could be used as dietary preventive natural products against *cisplatin*-induced sperm function parameters alterations during the treatment of cancer.

Keywords: *Wister albino Rats, sperm function parameters, Cisplatin, Honey, Royal jelly, Role, Testicular damage.*

Introduction

The infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse ¹. There are many reasons that cause infertility including cisplatin treatment. Cisplatin is anticancer chemotherapy drug used against several human cancers ². Despite the fact of its effective anti-cancer action, it exerts many unwanted adverse effects, including spermiotoxicity ³.

Honey and royal jelly are natural dietary substance has been previously investigated to ameliorate the

toxic side effects of different substance, through its antioxidant, free radical scavenging and anti peroxidative activity ⁴. Royal jelly has been associated with positive effects on human fertility, where it is effective on premenopausal symptoms, osteoporosis, improving hormonal equilibrium and fertility in women and men by increasing ovules and sperm quality ⁵.

The aim of the present study was to investigate the ameliorative role of honey and royal jelly against cisplatin induced alterations in sperm function parameters in male Wister albino rat.

Materials and Method

Animals: Healthy male wistar albino rats weighing 200-250gm (10-12 week age) were obtained from the animal house of R. C. Patel Institute of Pharmaceutical Education and Research, Shirpur-India. All animal experiments were approved by the Institutional Animal Ethics Committee (IAEC) of RCPIPER, Shirpur (Reg No. -651/PO/ReBi/S/02/CPCSEA). All the experimental procedures were carried out in accordance with the guidelines of the committee for the purpose of control and supervision of experiments on animal (CPCSEA).

Housing Conditions: The rats were housed in standard plastic cages. The bedding material of the cages was changed every day. Maximum of 3 rats housed per polypropylene cage having size of 32 X 11cm with stainless steel grill top mesh having facility for holding food palate and a water bottle. The rats were allowed free access to food, diet and water throughout the experimental period. All animals were housed in an air conditioned room at a temperature range between 22 -25°C, relative humidity in between 30% -60% and with a 12 hour light-dark cycle.

Chemicals: Cisplatin was purchased from Cipla Ltd company- Goa, India. Honey and royal jelly collected directly from the *Apis mellifera* colonies located in the university campus, Dr. B.A.M.U, Aurangabad,(M.S) India. Food pallet was purchased from Nutrivet Life sciences, Pune, Maharashtra, India. All other chemicals used in the experiment were of analytical grade.

Preparation of Royal Jelly and Honey:

500mg of honey and 100mg of royal jelly were dissolved in distilled water and administered through an intragastric tube through the mouth. The doses were weighed on digital scales where each dose relies on the relevant animal's weight, in which every single gram of the experimental rat should receive 0.5mg of honey and 0.1mg of royal jelly.

Preparation of Cisplatin:

Cisplatin was taken (7mg/kg/day) of the bottle and inject the rat's intraperiton. Also the dose is relied on animal weight in which every single gram of the target animal should receive 0.007 mg of cisplatin for 15 days, and the injection intraperitonally.

Experimental Design:

For the study, 24 adult male wister albino rats of 10-12 week age and with 200-250g weight randomly divided into 4 groups; each group consisting 6 rats (n=6) and they were treated for 15 days as below:

Group I (Control): 0.9% (10ml/kg/day) saline solution was administered for 15 days.

Group II (Cisplatin): Cisplatin (7mg/kg/day) intraperitoneal injection for 15 days ⁶.

Group III (honey+ royal jelly): Honey (500mg/kg/day) +Royal jelly (100mg/kg/day) orally administered for 15 days ⁷.

Group IV (Cisplatin+honey+royal jelly): 7 mg/kg/day of cisplatin injected intraperitoneally while honey (500mg/kg/day) and royal jelly (100mg/kg/day) were orally fed through an intragastric tube for 15 days.

Estimation of total sperm count:

The epididymal sperm count was determined by hemocytometry (Neubauer chamber) and the method described in the ⁸. 5 micro liter aliquot of epididymal sperms was diluted with 95 micro liter of diluent (0.35% formalin containing 5% NaHCOR3R and 0.25% trypan blue). With the widened micropipette tip, 0.5 ml of this suspension was diluted up to 10 ml with saline. A few drops of the diluted sperm suspension as a sample, was transferred into a Neubauer's improved counting chamber (depth 0.1 mm) and allowed to stand for 5 min. The sperm heads was counted and expressed as million/ml of suspension

Estimation of total sperm motility:

10 microliters of semen was placed on a glass slide and covered with a lamella. Using a light microscope with a magnification of 400×, the number of sperm with rapid progressive forward movement (RPFM), slowly progressive forward movement (SPFM), Non-progressive motility (NPM) and motionless (ML) sperm cells were counted in several microscopic field of vision and percentage of motile and Immobile sperm cells was obtained ⁹.

Determination of sperm viability:

Sperm viability was evaluated as follows. 20µl of 0.05% eosin Y and nigrosin were added into an equal volume of the sperm suspension. After 2 minutes of incubation at room temperature, slides were seen by light microscope with magnification of 400×. Dead sperm cells were appeared pink and live sperm cells were unstained. In each sample 400 sperm cells were counted and viability percentages was calculated ¹⁰.

Results

Effect of administration of cisplatin (G, II), honey and royal jelly (G, III), and the combined administration of cisplatin with honey and royal jelly (G, IV) on sperm function parameters of male wistar albino rats were evaluated in comparison with control (G, I) and obtained results were summarized in table 1.

The results are demonstrated that cisplatin administrated rats (G, II), exhibits significant decrease

in the values of sperm count, sperm viability, sperm motility, weight of epididymis and testis compare to control. The percentage decreased were 54.7 %, 81.9 %, 70.8% and 32.8 %, 31.25 %, respectively.

In the present study, it was observed that oral supplementation of honey and royal jelly to rat (G, III), caused non-significant increase in the values of sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis as compare to control. The percentages of values increased were 8.2 %, 2.7 %, 2.7 %, 4.4 %, 6.25 % respectively.

Combined administration of cisplatin along with honey and royal jelly to rat (G, IV), caused significant increase in the values of sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis compare to animal administrated with cisplatin (G, II). The percentage increased were 60.60 %, 284.61 %, 119.04, 13.33.8% and 27.27 %, respectively.

Table 1: Effect of royal jelly and honey on cisplatin-induced changes on sperm function parameters in male Wistar albino rats

Group	(G, I) Control	(G, II) Cisplatin	(G, III) Honey and royal jelly	(G, IV) Cisplatin with honey and royal jelly
Sperm Count (103 /cmm)	7.30 ± 0.29	3.30 ± 0.42***a # (- 54.7 %)	7.90 ± 0.83NSa # (+8.2 %)	5.30 ± 0.42**b w (+60.60 %)
Sperm Viability (Live sperms / 100 sperms)	72.00 ± 1.2	13.00 ± 0.60***a # (-81.9 %)	74.00 ± 1.2 NSa # (+2.7 %)	50.00 ± 3.5***b w (+284.61 %)
Sperm Motility (Motility Sperm / 100 sperms)	72.00±0.88	21.00±2.3***a # (-70.8%)	74.00±2.9 NSa # (+2.7 %)	46.00±1.8 ***b w (+119.04 %)
Epididymis Weight (gm)	0.67 ± 0.037	0.45 ± 0.037**a # (-32.8 %)	0.70 ± 0.043NSa # (+4.4 %)	0.51 ± 0.034*b w (+13.33.8%)
Testis weight (gm)	1.60 ± 0.048	1.10 ± 0.048***a # (-31.25 %)	1.70 ± 0.033NSa # (+6.25 %)	1.40 ± 0.031**b w (+27.27 %)

1. Mean ± indicate S.E.M. of three observations

2. # (+) or (-) indicate percent variation over respective control (G, I) rats

3. w (+) or (-) indicate percent variation over cisplatin injected (G, II) rats

4. Values are significant at * $P < 0.001$, ** $P < 0.01$, *** $P < 0.05$, NS –Non significant

5. a = $P < 0.001$, ** $P < 0.01$, *** $P < 0.05$ values compared with respective control rats

6. b = $P < 0.001$, ** $P < 0.01$, *** $P < 0.05$ values compared with respective cisplatin injected rats

Discussion

In the present study the decrease in the sperm count, motility and viability was attributed due to cisplatin induced oxidative damages to testis. Cisplatin induces generation of free radicals that leads to degeneration of leydig and sertoli cells. Oxidative stress impairs male fertility by changing the cell function like sperm motility¹¹, increase in DNA damage by induction of gene mutations, DNA denaturation, base pair oxidation and DNA fragmentation. Therefore, poor sperm count, motility and viability may be associated with oxidative stress and DNA fragmentation¹². Cisplatin is known to induce apoptotic germ cell loss and also sloughing of seminiferous epithelium¹³ which severely affects sperm count. Therefore, the reduction in the sperm count, motility and viability of sperm may indicate cisplatin-induced testicular and epididymal toxicity. So, these results may refer degenerative changes and hypofunction of testis¹⁴ which causing to azoospermia.

The decrease in the epididymis and testis weights of rats was attributed due to oxidative damage to testis induced by cisplatin¹⁵. This suggests that testis and epididymis are vulnerable targets to cisplatin in rats. Reduction in the testis weight along with disrupted spermatogenesis is a well-known side effect of cisplatin-based chemotherapy¹⁶. It is accepted that the weight of the testis largely depends on the mass of differentiated spermatogenic cells which has been used as a crude measure of the damage to spermatogenesis¹⁷.

In the present study, it was observed that oral supplementation of honey and royal jelly to rat (G, III), caused non-significant increase in the values of sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis as compare to control. However, these observations may

be attributed to the antioxidant properties of honey and royal jelly.

In combined administration of cisplatin along with honey and royal jelly to rat (G, IV), leads to significant increase in the values of sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis as compare to cisplatin administered rats (G, II) (table 1 and fig 1, 2, 3, 4). Results indicate that honey and royal jelly ameliorated the cisplatin induced toxicity. Similar results were reported by many authors¹⁸. Royal jelly has been associated with positive effects on human fertility, where it is effective on premenopausal symptoms, osteoporosis, improving hormonal equilibrium and fertility in women and men by increasing ovules and sperm quality¹⁹.

In the present study it was observed that in combined administration of cisplatin along with honey and royal jelly to rat (G, IV), caused significant increase in the values of sperm function parameters like sperm count, sperm viability, sperm motility, weight of epididymis and testis as compare to cisplatin administered rats this might be due to antioxidant properties of honey and royal jelly. Several studies have shown that honey contains flavonoids, phenolic acids, some enzymes (e.g. glucose oxidase, catalase), ascorbic acid, carotenoid-like substances, organic acids, amino acids and proteins²⁰. Many of these compounds have been shown to be cytoprotective by scavenging superoxide anion, hydroxyl radical, hydrogen peroxides, other reactive oxygen species (ROS) and reducing lipid peroxidation²¹. The amino acid content of both honey and royal jelly may play a role as well by enhancing acrosome reaction, sperm motility, or improving fertilization²¹ and enhancing sperm motility by the short-chain fatty acids specific of royal jelly, especially 10-hydroxy-2-decenoic acid²².

Honey and royal jelly also significantly enhanced semen motility and count and this is can be interpreted by the increase in testosterone level which is responsible for motility of the sperms. Moreover royal jelly enhances the production of seminal fluid from secondary sex organs, which play the major role in the motility and viability of the sperm during the nutritional supply; in addition zinc content of royal jelly could play a role in enhancement of sperm motility.

Conclusion

In conclusion, the present study clearly indicated that the cisplatin treatment caused impairment of sperm function parameters. Treatment with honey and royal jelly protect and restore the normal condition of sperm function parameters caused by cisplatin. The protective effect of honey and royal jelly is attributed to beneficial biological properties of its components, has been determined to exhibit antioxidant capacity and its ability to inhibit oxidative stress by ROS neutralization as well as the chemical composition and physiological functions of its proteins and vitamins.

Acknowledgment: The authors would like to express their gratitude to the C R. C. Patel Institute of Pharmaceutical Education and Research, Shirpur-India for providing the animals and facility.

Ethical Clearance: Taken from the committee

Financial Support and Sponsorship: Self-financing

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

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Organ Donation: Awareness, Attitudes and Beliefs among Undergraduate Medical Students

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Abstract

Background: To save and extend lives, Organ Donation (OD) and Organ Transplantation (OT) have become the only hope. Knowledge and attitude of health care providers towards OD plays a major role in promoting this concept among population. Objectives: To understand the awareness about OD among medical students and to assess their attitudes & beliefs towards it. Material & Methods: A cross-sectional study was conducted among 494 medical students of Dr. Pinnamaneni Siddhartha Institute of Medical Science and Research foundation. Data was collected by using predesigned pilot tested self administered questionnaire. Results: 74.2 % students could give the correct definition of OD. Internet was a source of information for 25.7 %. 94.7 % of the students felt that OD is necessary to save lives. 75.1 % students responded that OD involves risk. 97.2 % students approve OD. Fear of surgery is the main (42.9%) cause of refusal among 56 students. Religious beliefs of 56.7 % students are for OD and 24.4 % believed that OD advances premature termination of treatment. 17.6 % believed OD encourages euthanasia. Discussion: Although it was found that majority of the medical students were aware of certain aspects of OD, there exists significant gaps like knowledge about organ registry and OD card. Still there are beliefs in the budding doctors that OD encourages premature termination of treatment. Conclusion: These gaps are to be met by introducing OD topics in various levels of their curriculum along with social and ethical aspects. The outcome of this appraisal shows the necessity for more debate on OD to prepare future healthcare professionals.

Keywords: Organ Donation, Awareness, Attitude, Beliefs

Introduction

In India, 500,000 people die every year because of non-availability of organs; 200,000 due to liver disease, 50,000 due to heart disease. 150,000 people await a kidney transplant but only 5,000 get one. 1,000,000 people suffer from corneal blindness and await transplant. Around 9.5 million deaths occur annually of which nearly 0.1 million deaths are due to organ failure. Though India has a population of 1.2 billion, organ donation rate is only 0.08 persons per million which is very insignificant when compared to the rest of the world.⁽¹⁾

To save and extend lives, OD and OT became the only hope ^(2, 3). OT is the most preferred treatment modality for end-stage organ disease and organ failures ⁽¹⁾. Many organs such as cornea, kidney, and liver are commonly transplanted to human recipients. However,

the need for the transplants is high and the gap between organs available for transplantation and the number of patients waiting for a transplant is widening globally⁽²⁾. There is a worldwide shortage of donor organs in comparison to the need for transplantation ⁽⁴⁾.

The shortage in organ supply is due to lack of awareness ⁽⁵⁾ among public, myths and misconceptions surrounding OD due to religious and cultural barriers leading to hesitancy in donation of human organs. There is a significant relation between public attitude towards OD and availability of such organs ^(6,7). It is identified that there is reluctance of family members to donate organs due to fear of surgery leading to loss to health ⁽⁸⁾. The prerequisites for the success of a transplantation program include awareness, positive attitude of the public toward OD and consent by relatives for OD in the event of brain death⁽⁴⁾.

In India, Transplantation of Human Organs Act, was passed in 1994 in order to regulate the removal, storage, and transplantation of human organs for therapeutic purposes. It also aimed at prevention of commercial dealings in human organs. The amendment to the act was passed by the parliament in 2011, and the rules were notified in 2014⁽¹⁾. As per the Transplantation of Human Organs (Amendment) Act 2011, the National Organ and Tissue Transplant Organization (NOTTO), a national level organization was set up under Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. The Standard Operative Guidelines, IEC Materials and Operational guidelines are available in the website (<https://notto.gov.in/awareness.htm>).

Knowledge and attitude of health care providers towards OD plays a major role in promoting the concept among population⁽⁹⁾. Studies have shown that health care providers including medical students lack adequate knowledge about OD⁽¹⁰⁾. The “Jeevandaan” programme (deceased donor program) of the Government of Andhra Pradesh has been facilitating organ distribution. By 2013 however, only 246 organs could be retrieved. The shortage of OD is the major limiting factor in the transplant program, in spite of improvement in graft and patient survival rate⁽⁶⁾.

The present study helps to identify the awareness, attitude and beliefs of medical students regarding OD.

Materials and Method

This is a cross sectional descriptive study, conducted from June 2017 to September 2017 at the Dr. Pinnamaneni Siddhartha institute of Medical Sciences & Research Foundation, Chinnoutapalli, Krishna district of Andhra Pradesh. Ethical approval was obtained from the Institution Ethical Committee (IEC) of the institution and 521 medical students from 1st year to final year were given the pre designed, pilot tested, self-administered questionnaire consisting of questions regarding socio demographic data, awareness, attitudes and beliefs on OD. Informed consent was taken from each participant. The questionnaire was distributed to the students in the lecture galleries and they were instructed not to

discuss the questions among themselves. Anonymity and confidentiality of respondents were maintained and participation was voluntary. 494 students completed the questionnaire with a response rate of 94.8 %. Only completed questionnaires were utilized for the study. The data obtained was entered in MS excel and analyzed. The results are presented as proportions and as tables.

Results

Majority (83 %) of the students were in the age group of 18 to 21 years. 67.2 % were females. The majority (87.9%) are Hindus. Nearly 66 % belong to OC category. 31.4 % students were from first year. 78.8 % participants came from urban areas and 82.6 % from nuclear families.

Regarding awareness, all students heard about OD and 99.2 % were aware of OT. 74.2 % were able to give correct definition of OD. The major (25.7 %) source of information is internet. 84.2 % responded that organs can be donated from live, dead & brain dead persons. 94.7 % participants felt that OD saves life. 75.1 % responded that OD involves risk. Major risks stated were organ rejection, infection, weakness, bleeding and pain. (Table 1)

Concerning attitude, 65.6 % did not know about OD register, and most of them (80.3 %) had no idea where to obtain the OD Card. Many students are comfortable in talking & thinking about OD and many approve it. 88.7 % agree to donate organs. However 8.7% were willing to donate when they are alive. 23 students said that they would donate in special circumstances. Causes of refusal of OD were fear of surgery, no belief in health system, religious beliefs and concern for commercialism. (Table 2)

Regarding beliefs, 56.7 % responded that their religious beliefs allowed for OD. However 91.3% believed that there would be misuse of OD. 24.4 % students believed that due to OD there would be premature termination of treatment in a dying person in order to facilitate OD. 17.6 % believed that OD encourages euthanasia. (Table 3)

Table 2: Attitude regarding OD

Attitude	Response	Frequency	Percentage
Heard about OD register	Yes	170	34.4
	No	324	65.6
Source of obtaining OD card	Yes	97	19.7
	No	397	80.3
Comfortable while talking or thinking	Yes	451	91.3
	No	43	8.7
Approve OD & OT	Ye	480	97.2
	No	14	2.8
Agree to donate organs	Yes	438	88.7
	No	56	11.3
If yes, willing to donate as live donor (n=438)	Yes	38	8.7
	No	400	91.3
As a live donor, will you donate irrespective of situation (n=38)	Yes	15	39.5
	No	23	60.5
If no, causes of refusal (n=56)	Religious	10	17.9
	Commercialism	9	16.1
	Surgery fear	24	42.9
	No belief in health system	13	23.2
Family's consent	Yes	313	63.4
	No	181	36.6
If your loved one needs transplant	Check for donor	109	22
	Donate mine	385	78
Acceptance, if hospital approached for OD of deceased family member	Yes	321	65.1
	No	173	34.9

Table 3: Beliefs regarding OD

Beliefs	Response	Frequency	Percentage
Religion agrees OD	Yes	280	56.7
	No	40	8.1
	Don't Know	174	35.2
Misuse of organs	Yes	451	91.3
	No	20	4
	Don't know	23	4.7
OD encourages premature termination of treatment	Yes	120	24.4
	No	55	11.2
	Don't Know	317	64.4
OD encourages Euthanasia	Yes	87	17.6
	No	195	39.5
	Don't Know	212	42.9
Need effective laws	Yes	407	82.4
	No	87	17.6

Discussion

OD and transplantation are the most important treatment modalities of many end organ diseases. Medical students should have sufficient knowledge regarding OD so that they can bring awareness and behavior change in the community. Studies show that health professionals can positively influence the opinions and attitudes of patients and their relatives, leading to higher rates of organ procurement^(11, 12). It is therefore important to determine the level of knowledge among medical students and their attitude towards OD.

The important questions to be answered in this appraisal are; Do medical students have enough knowledge about OD? What is their attitude towards OD? And what are their beliefs regarding OD?

Regarding the sample of students in the current study, the demographic details of age and sex are similar to studies by Prince Alex et al⁽¹²⁾, Karini D et al⁽¹³⁾ and

Shreya Agarwal⁽¹⁴⁾. A study by Sindhu et al in the AFMC had a higher male population. Hamed Het al⁽¹⁶⁾ in their study had 60 % participants from urban background. The study by Karini D et al⁽¹³⁾ had almost the same percentage of first year medical students (27.8%).

In our study, 100 % participants heard about OD as seen in other studies⁽¹⁴⁾. Like in other studies done in India⁽¹³⁾, a majority of medical students in the current study defined OD correctly. The source of information for majority of them was internet while elsewhere it was television⁽¹⁵⁾. Most of the students responded that organs can be donated from live, dead & brain dead persons but in Shreya Agarwal's study only brain dead patients were considered as potential donors for OD by the majority⁽¹⁴⁾. Awareness about the OD register was seen in only a small number of the students, but when compared to a study in Malaysia 77.7% were aware of the OD registry⁽¹⁷⁾.

All students approved the concept of OD as seen in another study from South India ⁽¹⁸⁾. A study from UK showed that attitude to OD was overwhelmingly positive in nearly two thirds of the students. A good number of students in this study agreed to donate their organs. However, only a small number are willing to donate when they are alive. Most of the students are agreed to OD after their demise as was also seen in a study by Vinay KV et al ⁽²⁰⁾. Not all are willing to donate organs irrespective of the situation. Some students specified that they would donate only in special situations. Similar result from Egypt study showed that a good number of students were willing to donate to any recipient while some were selective ⁽¹⁶⁾. Three fourths of the participants said that they would donate organs of their own when their loved needed them while one fourth of them look for donor. However in a study by Vinay KV et al ⁽²⁰⁾ almost half the number of students in each year of MBBS were ready to donate their organs to their family members.

Causes of refusal of OD in this study were fear of surgery, no belief in health system, religious beliefs and commercialization of transplantation procedures. The causes of refusal seen in an Egyptian study by Hamed H et al ⁽¹⁶⁾ were familial refusal (13%) religious prohibition (19%) fear of commercialism (27%), fear of surgery (10%) and lack of confidence in the health care system (31%).

Regarding donating an organ from their own deceased family member, in this study, 65.1 % of subjects are willing which is similar to the study by Karini Det al ⁽¹³⁾. Concerning beliefs of students, a good number of subjects said that their religious beliefs are in agreement with OD as seen in a similar study ⁽¹⁸⁾. However in agreement to the above study, a third of the students were ignorant of any religious connotations regarding OD. A study by Shreya Agarwal et al ⁽¹⁴⁾ states that only 14.2% students cited religious beliefs as the reason to refuse OD.

The current study showed that a majority of students believed that there would be a misuse of organs as seen in a study by Karini D et al ⁽¹³⁾ study. Most students maintained that there should be effective laws and a regulatory body to govern OD and the similar finding was seen in a study by Sucharita ST et al ⁽¹⁸⁾.

Conclusion

Majority of undergraduate students were aware of OD in a broad manner. However awareness on issues like Organ registry and OD card was lacking. There is a need for lectures, seminars and workshops to be included in the MBBS curriculum regarding the physiology of OD and transplantation, related pathology, immunology, pharmacology and the relevant medical and surgical details. There is also a need to include student centered group discussions on the social and ethical aspects of OD. The misconceptions about OD in these budding doctors need to be addressed. The results of this study show the necessity of more debate and knowledge to prepare the next generation of healthcare professionals about transplants and OD.

Acknowledgement: The authors are grateful to Indian Council of Medical Research (ICMR) for their grant under STS programme for the study (Grant number: 2017-00992) and to the students of Dr.PSIMS &RF for their participation in the study.

Ethical Clearance: Ethical approval (**Certificate No. 201/UG/2017**) was obtained from Institutional ethical committee (IEC) of Institutional Research Cell (IRC) of Dr.Pinnamaneni Siddhartha Medical Science and Research Foundation (**ECR/804/Inst/AP/2016**).

Conflict of Interest: Nil

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Internet use and Physical Health Problems in School Going Students

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Abstract

Background: The Internet and mobile phone is becoming increasingly important and essential to the educational and social lives of adolescents and have become an integral part of their lives. Misuse or excessive use of the internet can cause mental and physical health issues in adolescents. 35% of internet users in India are adolescents. Hence, this study was conducted to evaluate internet use and physical health problems in school going adolescents.

Method: The cross-sectional study was conducted on 1600 school students (14-16 year of age) of Kolhapur city, Maharashtra. A semi-structured questionnaire with questions pertaining to internet use and associated health issues was used for data collection. Data was analysed using R Studio V 1.2.5001.

Results: Most of the students (48.1%) use the internet for 1-2 hours every day, 2-6 days a week and the phone was the common mode of internet use (48%). A significant association was observed between internet usage time and complications such as headache, neck pain, eye dryness, eye redness, thumb pain, backache, numbness in the finger, and disturbed sleep (P = 0.0004). A significant association was noted between the mode of internet usage and wrist pain (P= 0.004).

Conclusion: A number of physical health complications were found to be associated with internet usage with the mode of internet also playing a significant role.

Keywords: Adolescent, back pain, cell phone, headache, internet, neck pain

Introduction

The internet in this era is easily available to almost everybody and is widely used for work and leisure.¹ Unique features and benefits of the internet such as highly engaging and motivating virtual components, portability and multitasking makes it a very attractive tool, easily and quickly accessed through laptops and mobile phones. Among the younger population, the internet is a prevalent

mode of communication and networking.^{2,3} Adolescents utilize the internet for information searching, sharing personal information, social media and recreational activities and it is incorporated in their daily lives.⁴ However, misuse of the internet among adolescents has become a major health concern the world over.^{5,6}

The use of the internet can cause disturbed mental and physical conditions of adolescents.⁷ Several studies have demonstrated that individuals can become addicted to online activities, in particular those with psychological and emotional problems such as depression, anxiety, loneliness, distraction and lack of sleep.^{6,8-10} Moreover, misuse or excessive use of the internet can lead to physical health issues such as dry eye, carpal tunnel syndrome, repetitive motion injury, wrist pain, neck pain,

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backache, shoulder pain, headache, and numbness and pain in fingers.¹ The debate of risks versus benefits of the internet, in particular on its physical and psychosocial impact on vulnerable populations like adolescents is one that requires constant evaluation given that the internet and its contents are constantly changing. On this premise, the study aimed to evaluate the internet use and its related physical health problems among school going students.

Material and Method

The cross-sectional study was carried out from December 2017 to September 2019, after obtaining ethical approval from the Institutional Ethics Committee on 1600 school going students of Kolhapur city, India. Samples were selected based on a simple random sampling technique. Students in the age group of 14-16 years who use the internet were included in the study sample. Students who don't use the internet, who have mental or psychiatric disorder, ophthalmic problems and migraine prior to the use of internet were excluded. Informed consent was obtained before initiation of the study.

A semi-structured questionnaire was used to collect the data. It consists of a structured proforma to obtain

information about education qualification and status, the purpose of using the internet, time of the day when the internet was accessed the most, duration of use of internet per day, height weight and BMI of the participant and health-related problems associated with internet usage such as headache, thumb pain, backache, numbness in finger, wrist pain, disturbed sleep, neck pain, eye dryness, and eye redness. Completed questionnaires were collected, the data tabulated and the results statistically analysed.

Statistical Analysis

Data was analysed using R Studio V 1.2.5001. Categorical variables were expressed in frequency and percentage and the continuous variable was expressed in mean \pm standard deviation. A chi-square test was used to find the association between the variables. $P < 0.05$ was considered as statistically significant.

Results

The average age of the 1600 students was 15.19 ± 0.83 years and 57.43% of the students were male. Most of the students use the internet 1-2 hours daily and 2-6 days of the week and the mobile phone was the common mode of internet use (table 1).

Table 1. Daily, weekly and mode of internet used by students

Usage of internet	Frequency	Percentage (%)
Per week (days)		
0-1	486	30.4
2-6	770	48.1
Every day	344	21.5
Daily (hours)		
<1	307	19.18
1-2	771	48.18
2-3	401	25.06
3-4	110	6.90
>4	11	0.68
Mode of use		
Computer	745	46.6
Phone	768	48
Both	87	5.4

Headache (30.1%), backache (26.3%), disturbed sleep (28.6%), and thumb pain (25.9%) were the commonly observed complications in the students (figure 1).

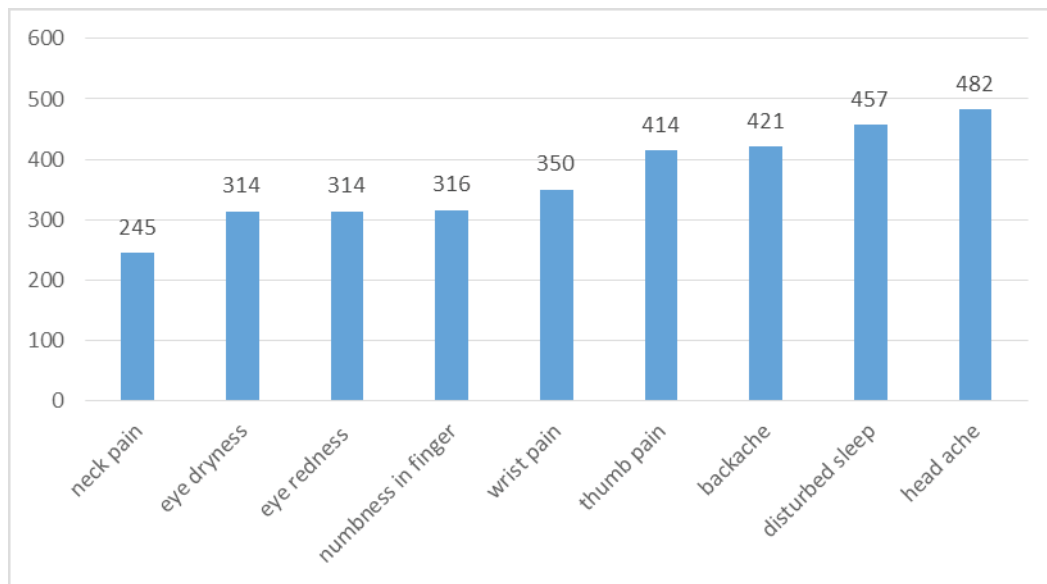


Figure 1. Frequency distribution of different complications observed

A significant association was observed between internet usage time and complications such as headache, neck pain, eye dryness, eye redness, thumb pain, backache, numbness in the finger, and disturbed sleep ($P = 0.0004$). The number of health-related problems was found associated with duration of internet use ($P 0.0004$), also a significant association was noted between mode of internet usage and wrist pain ($P 0.004$).

Discussion

The Internet is increasingly important to adolescents for educational and social activity. Easy availability of the internet and mobile phones gives young people access to the internet at any time and place, thus posing the risk of the internet competing for priority space in their personal and academic lives.¹¹ Obsessive, excessive use of the internet may lead to impaired physical and mental health of adolescent students.^{8,12} The study was aimed to evaluate internet use and physical health problems in school going students. The use of the internet for 2 to 6-days per week was seen in 48.1% of students while 30.4% and 21.5% of the students were using the internet <2 days and every day of the week respectively. Similar results were observed in the study of Tan et al.¹¹ The study by Bhatiya et. al showed 60.43% of students were spending <2 hours for internet use and 2-4 hour use was

observed in 26.33% of students.¹³ In the study, most of the students (48.18%) were found to be spending 1-2 hours daily on the internet whereas, <1 hour and 2-3 hours daily use was observed in 19.18% and 25.06% of students respectively. Internet use depends on developmental, gender, and social characteristics of adolescents. As age progresses from childhood to early adolescence, general internet usage increases and then levels off, perhaps due to increasing academic work in high school.¹⁴ Data shows that 20% of African students reported spending 2 hours per day online while the values are at 42% and 40% in Chinese and American students respectively. Literature shows that internet addiction among African students was far more prevalent when compared with Chinese or American students despite limited access to the web implying that ease of access and availability were not strong determining factors for use and addiction.¹⁵

It is evidenced that excess internet use can cause musculoskeletal pain.^{12,16,17} This is possibly due to remaining in a fixed position over long periods; subsequently, more pressure is exerted on the part of the body involved such as the muscles, discs and tendons or may be due to poor postural habits.¹⁸ In the study, headache (30.1%), neck pain (15.3%), wrist pain (21.9%), numbness in finger (19.8%), back pain (26.3%), and

thumb pain (25.9%) was observed in the students. The study of Bohany T. et al showed complications such as headache (46%) neck/shoulder pain (41.3%), back pain (42%), wrist pain (16%) in participants.¹³ Similarly, the study by Yang G. et al and Park S. Et al. showed similar observations.^{18,19} Sleep problems, depressive symptoms, and eyesight problems were commonly reported with the use of internet and phones.²⁰⁻²³ The study showed disturbed sleep in 19.6% students and eye redness, eye dryness was seen in 19.6% of students. Similar results were observed in the study of Bener et al.¹ A significant association was found between internet use and physical health complications which is similar to the findings of Yang G. et al.¹⁸ Repetitive stress injury or repetitive strain injury are the conditions affecting the muscular and nervous system caused by doing the same task in the same position for long durations.^{24,25} The mode of internet use (computer or mobile phone) for long duration in same posture can cause musculoskeletal injury.^{12,26} Similarly, wrist pain was found associated with the mode of internet use which is may be due to prolonged gripping of the phone with the wrist pronated and extended (P 0.004).¹⁸ No similar data was found similar to these findings. Excessive use of the internet has also been linked to poor academic performance.²⁷ Students in the age group of 14-16 years are frequently found in the 10th grade and declining exam pass percentages in this group and its possible association with internet use must be reflected upon and studied.

Conclusion

This study provides an overview of the pattern of internet use and its association with physical health problems among adolescents. The study is limited by the fact that internet addiction among the students was not evaluated, reporting bias by students may be present due to self-reporting, and psychological effects were not evaluated. These pave way for further research in the arena.

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Clinical Profile of Dengue Fever and Associated Expanded Dengue Syndrome in a Tertiary Care Hospital

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Abstract

Background: The worldwide epidemiology of dengue fever (DF) and dengue hemorrhagic fever (DHF) is changing fast. The Indian encounter with this disease is fascinating and captivating. In recent years the disease has distorted its course exhibiting in a severe form as DHF, dengue shock syndrome (DSS) and Expanded Dengue Syndrome.

Methods: The present study is an observational prospective study conducted in a single unit of the department of Medicine of a tertiary care hospital. Institutional ethics committee approval was obtained prior to enrolment of any patient.

Results: The work presented in this study expands the knowledge base of dengue clinical profile and management. Fever, thrombocytopenia, raised transaminases were the common findings in the 150 patients studied. Hemorrhagic manifestations were observed in 20 patients who had required platelet transfusion.

Conclusion: Dengue fever is always the foremost of these arboviral infections with significant impact on socioeconomic and healthcare cost for the patient. The clinical picture can be non-specific viral prodrome to classical dengue fever to life threatening dengue shock syndrome(DSS)/dengue haemorrhagic fever(DHF). Early diagnosing and with aggressive management particularly for DHF and DSS remains the cornerstone strategy for good outcomes.

Keywords: *pericholecystic oedema, raised transaminases, myocarditis*

Introduction

Dengue viral infections have been endemic in tropical and sub-tropical areas which were previously considered as non-endemic to dengue virus. The main areas are Asia, Americas, and the Caribbean. Typically, transmission of dengue virus peaks near the equator

during the annual rainy season. Dengue virus is a small single stranded RNA virus belonging to family Flaviviridae; genus Flavivirus, with approximately 4 billion human beings spreading 128 nations at risk of DENV infection.

Material and Method

We conducted a study in a tertiary care centre situated in north India in a single unit of the department of medicine for one and a half year. Blood samples from 150 clinically suspected and serologically positive cases of dengue infection (according to WHO criteria) were taken after receiving approval from the Institutional Ethics Committee. The informed written consent was

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taken from each participant before enrolment into the study. The dengue seromarkers used in this study were NS1 antigen, IgM and IgG antibodies. The method which was employed in the study was a Rapid immunochromatographic test (card test). All patients with confirmed serology (IgM positive alone or both IgM and IgG) or NS1 antigen positive dengue fever patients were enrolled. The other requisite tests were done for each of the dengue patients. In addition to these specific markers, age, gender, fever duration, clinical manifestations and laboratorial parameters were recorded for each patient.

Results

The demographic data and the results of haematological parameters, transaminases, renal function tests has been shown in table 1. The patients of the age group below 18 had been excluded as the study had been conducted in the department of Medicine.

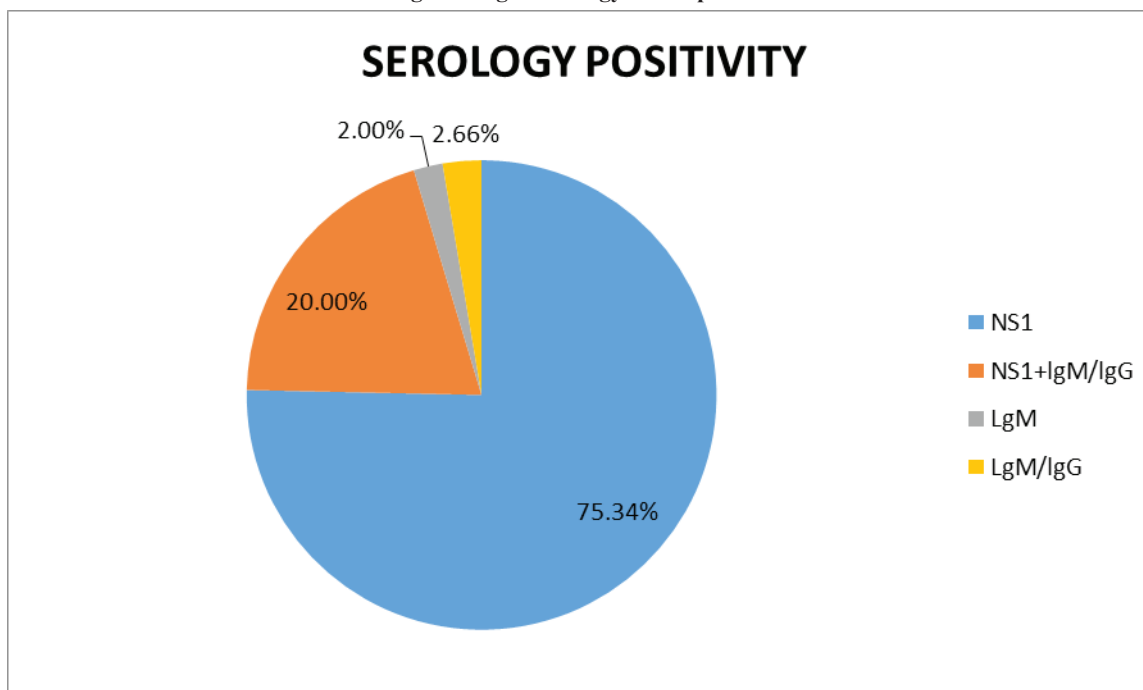
TABLE 1: DEMOGRAPHIC DATA OF 150 PATIENTS

	Mean \pm Std dev	Median	Min-Max
Age	35.03 \pm 13.75	30	18-80
Hb%(gm/dl)	13.53 \pm 2.02	13.6	8.1-17.7
PCV%	39.43 \pm 5.13	39.3	25.4-52
WBC(cells/cu.mm)	5354.67 \pm 2990.76	4950	1400-24000
Platelet count(cells/cu.mm)	50793.33 \pm 37616.27	40000	6000-200000
Serum Bilirubin(mg/dl)	0.85 \pm 1.5	0.54	0.13-15
SGOT(IU/L)	345.81 \pm 1212.81	90	17-12000
SGPT(IU/L)	222.39 \pm 737.68	86.5	14-7600
Urea(mg/dl)	32.5 \pm 23.52	28	12-160
Creatinine (mg/dl)	0.97 \pm 0.65	0.84	0.31-6.8

Out of 150 cases studied melena was seen in 8(5%), ecchymosis in 7(5%), hematemesis in 5(3%). Dengue serology revealed NS1 positivity in 143 (95.34%) patients and out of those 143 patients, 113 were exclusively NS1 positive and the rest 30 were associated with IgM or IgG or both. Three (2%) patients were exclusively IgM positive and 4 (2.66%) were both IgM/IgG positive.(Fig 1) In this study of one fifty patients 120 (80%) had dengue

fever and 20(13%) were diagnosed as DHF, 10(7%) had Dengue Shock Syndrome. Albuminuria was present in 54(36%) of the patients and 29(19%) patients had RBC in urine. Out of 150 patients, myocarditis was present in 7(4.67%) of the patients. Out of 150 patients, 107 patients (71.33%) had gall bladder involvement in the form of gallbladder wall thickening or pericholecystic oedema, 43(28.67%), had no involvement.

Fig 1- Dengue serology of 150 patients



Discussion

Despite dengue's enormous global impact there is still no licensed therapeutic to combat the toll of the disease on patients and overburdened health systems in the tropical world. There is a pressing need for a therapeutic that can shorten the duration of illness and reduce the risk of disease progression. Clinical trials have been conducted in dengue that have used different approaches to influence the disease outcome. These include attempts to reduce dengue viraemia or modulate the host response to dengue infection. Unfortunately, to date, these attempts have not demonstrated a clinical benefit. However, in 2016 a vaccine to prevent dengue fever (Dengvaxia) became commercially available in some countries. WHO in 2018 september had updated its recommendations for the use of this vaccine and substantiate that seronegative vaccine recipients have an excess risk of severe dengue compared with those of seronegative individuals who are unvaccinated .

Gastrointestinal complaints:

We had 70 (46.67%) of patients with abdominal pain. Fifty one(34%) of our patients experienced nausea and vomiting and loose stools were seen in 2 (1.33%) of the patients. Hepatomegaly was observed in 15 (10%) of our patients. Enlarged spleen was palpable in 7 (4.67%)

of our patients.

Ultra-sonographic findings:

Acalculous cholecystitis has been documented in many case reports of dengue fever. In ultrasound examination an asymptomatic gall bladder wall oedema can be an alternate marker of dengue during epidemic before arrival of laboratory investigations report. The main pathology behind this is plasma leakage which results in deposition of fluids in various organs (gallbladder, pleural effusion, and ascites). Thickening of wall of gallbladder, a positive Murphy's sign, pericholecystic collection of fluid with no stones in the gallbladder along with raised alkaline phosphate values are the features. In our study gall bladder wall thickening or pericholecystic oedema was seen in 107 (71.33%), pleural effusion in 13 (8.67%) and ascites in 5 (3.33%) of our patients. A study done by Santosh et al found that out of sero-positive 96 cases of dengue, 66.7% patients had oedematous gallbladder wall thickening, 64.5% patients were having ascites, 50% patients were found to have pleural effusion.¹ In a study done by Parmar et al demonstrated distinct patterns of gall bladder wall thickening in dengue fever patient. and suggested that honeycombing pattern may predict severity of the disease.²

Serology and laboratorial parameters:

We confirmed a diagnosis of dengue fever with NS1, IgM and IgG rapid immunochromatographic tests and included patients who were NS1 antigen positive or IgM positive alone or both IgM/IgG positive. The seromarker NS1 antigen which is a highly sensitive dengue marker for dengue infections is detected from the first day of fever and it was done within first 3 days of presentation of fever. This is in accordance with a study conducted by Hang et al.³

From the above it can be said that a large number of cases would be missed if NS1 antigen is not included in the test panel for dengue virus infection detection. Those who are exclusively NS1 positives could be offered appropriate supportive therapy, thus avoiding any irrational use of antibiotics. The patients and their attendants could be briefed regarding the basics of vector biology and provided with mosquito nets during viraemic phase to further prevent the spread of infection to others. The dengue specific antibodies appear only by third to fifth day of fever in primary dengue infection. Even in most secondary infections, both IgM and IgG type antibodies cannot be recorded before the third day. Both in primary and secondary dengue infection there is always a window period, when only antibodies are detected. Moreover, the utility of antibody relies mainly on the rising titres especially in endemic areas. The seromarker NS1 antigen which is a highly sensitive dengue marker for dengue infections is detected from the first day of fever⁴

Platelet transfusion:

A total of 20 patients (13.33%) received platelet transfusion in our study group. The indication being severe thrombocytopenia, bleeding manifestations such as hematemesis or malena. Kulkarni et al⁵ in her study 118(51%) out of 232 patients received single unit platelet transfusion with platelet counts between 20,000 and 1,00,000 cells/mm³ and 64(27.5%) with platelet of <20,000 cells/mm³ received multiple platelet transfusions. They concluded that 51% of platelet transfusions were inappropriate and more effective when it is given with a platelet count of <20,000cells/mm³.

David C Lye et al⁶ in their open-label, randomised, superiority trial in five hospitals in Singapore and

Malaysia involving 372 patients concluded that that prophylactic platelet transfusion was not superior to supportive care in the prevention of bleeding in adult patients with dengue as it is associated with risk of transfusion related adverse effects. Our study was in line with that, 20 patients who received platelet transfusion, 8 were those who had malena, 5 were having hematemesis and 7 had ecchymosis with severe thrombocytopenia. Out of which 17 recovered and 3 deaths occurred.

Urine Albumin:

Increased urinary excretion of protein in patients infected by dengue virus is thought to be a hallmark of vascular endothelial cells defect and plasma leakage associated with complicated forms of dengue and is considered a possible prognostic marker⁷ Proteinuria has been reported in up to 74% of patients with dengue haemorrhagic fever (DHF)⁸ and cases of self-limiting nephrotic-range proteinuria in patients with DHF presenting no manifestations of renal damage have been described. In our study 54 (36%) out of 150 patients were having albuminuria detected by dipstick in urine specimens. Andries et al observed that decreasing proteinuria is a sign of improvement.⁹

Myocarditis:

Dengue myocarditis has spectrum from mild case of only ECG changes to severe case of myocarditis induced acute heart failure (cardiogenic shock). There is no conclusive pathogenic mechanism for dengue myocarditis. Direct viral invasion of cardiomyocytes, myocardial oedema from local capillary leakage, overwhelming cytokine effect, coronary hypo perfusion and intracellular calcium homeostasis disruption have just partly explained the pathophysiology.¹⁰

Our 7 (4.67%) patients presented with myocarditis in form of sinus bradycardia, arrhythmia and shock with evidence of electrocardiographic abnormalities, abnormal cardiac biomarkers (elevated CPK MB).

If viral myocarditis was a primary event thought in our patients, it would be difficult to differentiate it from other causes of such manifestations like plasma leakage, shock occurring in Dengue fever thus, separating secondary cardiac effects from primary cardiac involvement is difficult, and this may have led to under-

reporting of cardiac involvement in the past.

Dengue virus induced myocarditis is underreported but it may be an important cause of the mortality in Dengue fever. Because of its nonspecific clinical features and variable electrocardiographic (ECG) and echocardiographic (2D ECHO) findings it requires a high degree of clinical suspicion by the treating physician. Awareness is important for this entity to prevent the high mortality.

Expanded dengue syndromes:

The World Health Organization (WHO) has coined the term expanded dengue to describe the cases which do not fall into the category of either dengue haemorrhagic fever or dengue shock syndrome. Unusual manifestations of patients with severe organ involvement such as liver, kidneys, brain or heart associated with dengue infection have been increasingly reported in dengue haemorrhagic fever (DHF) and also in dengue patients who do not have evidence of plasma leakage.

Neurological involvement in dengue fever is heterogeneous. Intra-cerebral haemorrhage, encephalitis, aseptic meningitis and acute disseminated encephalomyelitis are seen due to neuro-virulent effect of dengue viruses and serotypes 2 and 3 have been isolated from the CSF of dengue patients.¹¹

One patient in our study presented with monoparesis of right arm with associated NS1 positive dengue fever. All other causes of nervous system involvement were ruled out in this patient; hence dengue remained the only culprit. Patient's right arm weakness resolved within 10 days of resolution of fever. There are numerous other organ system involvements seen in expanded dengue syndromes.¹² One of the patient had associated hypoparathyroidism and had presented with hypocalcemic tetany which the authors had presented earlier as a case report.¹³

In our study 7 patients with unusual manifestations of severe multi organ involvement such as liver, kidneys, brain or heart associated with dengue infection were reported to be in DSS leading on to the mortality of 5. These unusual manifestations might be associated with other coinfections or co-morbid conditions or due to complications of prolonged periods of shock and can

be clubbed under the expanded dengue syndrome. They may be potentially serious and may result in increased rates of morbidity and mortality in dengue fever, which can be preventable with prompt diagnosis and judicious management. Therefore, we should be aware of these atypical manifestations.

Conclusion

Our study focused on the clinical profile of dengue fever in correlation with the blood parameters. It was concluded in this study that fever with headache along with thrombocytopenia, decreased TLC count and raised serum transaminases levels should raise a strong suspicion of Dengue fever for which screening and confirmation must be done. This study supports the concept that in comparison to IgM and IgG antibodies for dengue fever, NS1 antigen testing is an effective tool for diagnosis of dengue infection particularly in early diagnosis of dengue infection when antibodies are not at a detectable level. Detection of all three parameters NS1 antigen, IgM, IgG antibodies simultaneously gives more information regarding the primary and secondary infection. In this study immunochromatographic test was used in the diagnosis of dengue infection which is a cheap, prompt and accepted standard test method for dengue diagnosis which notably holds its place in our country with an ever-increasing number of dengue patients. In our study gall bladder wall thickening or pericholecystic oedema was seen in 107 (71%) patients thus showing a direct relationship of ultrasonographic findings with dengue fever. Hence showing the use of advanced radiology in future diagnosis of severity of dengue fever. Our study highlighted the ever-perpetuating spectrum of dengue expanded syndromes in form of renal involvement, myocarditis, monoparesis, hepatic dysfunction and severe multi organ system involvement.

Ethical Clearance- Ethical approval was taken from the Institutional Ethics Committee before initiating the study.

Source of Funding- self

Conflict of Interest- Nil

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Attitude of Medical Students Towards Dissection on Human Cadaver: A Study on the Students of a Medical College of Eastern India

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Background : Dissection of cadaver is an integral part of anatomy. It is a vital component in order to understand the relations of structures and to have an orientation on the subject. With the advent of modern technologies and equipments like synthetic cadavers, virtual dissection table and lack of adequate number of cadavers, the importance of dissection seems to be compromised among students.

Aim and Objective: This study was conducted to find out the attitude of MBBS students towards cadaveric dissection. It focused on the emotional and psychological aspect on the tender minds of students.

Material and Method: The study included 1st year MBBS students. It was conducted after 3 months of their exposure to the course. A formatted questionnaire was given to them. The questionnaire included some general information about the students, some questions regarding their feeling towards cadaveric dissection. The questions were to be answered in Yes or No.

Discussion and Conclusion : The response of the students was tabulated and analyzed. The data revealed that only 21.58% students preferred for dissection. Majority of students don't perform dissection. The most frequent cause of it was smell of formaldehyde (38.85%) and lack of adequate number of cadavers (15.11%). There are other factors too which expels them from dissecting the cadaver. Many other angles were explored and discussed.

Key words: Attitude, dissection, cadaver, psychological

Introduction

Anatomy is one of the first, most basic, and a major part of the MBBS curriculum. It is very necessary for students to have a clear understanding of clinical sciences. The provision of learning gross anatomy has an emotional as well as intellectual approach to

medical education. Cadaveric dissection is the key stone of learning anatomy. It helps the MBBS students to acquire adequate information, orientation, about the 3-dimensional architecture of human body. Cadaver dissection also plays a very important role and acts as a building block that provides essential knowledge required for the duration of the future studies of the MBBS students. Many students express a cocktail of emotional reactions, different types of feelings when they come across the cadaver for the first time. To study these effects, many studies have been conducted by various researchers. Many studies have shown a positive attitude of students, however some studies also reported adverse effects too. The present study is done to estimate the effect of dissection on the tender minds of first year MBBS students.

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Aim of the Study

- To study the psychological effect of dissection while doing it on cadavers.
- Attitude of students towards dissection.
- To know about the preference of students towards cadaveric dissection as compared to modern amenities available.

Material and Method

This is a cross sectional study. The study was conducted on 1st yr. MBBS students of IMS & SUM Hospital, Bhubaneswar. It included 278 students. Purpose of the study was explained to the students. Formal consent of the students was taken. Formal permission was taken from ethical committee of the institution. Name of the students was not recorded to have a free opinion. The students were given a formatted questionnaire after 3 months of commencement of course. The answers were analyzed and tabulated.

Questionnaire

- Name -
- Age - Sex - Religion -
- Dissection done = Yes/No

- Reason for not performing dissection
- Fear/ Smell of formaldehyde/ Anxiety/ Laziness/ Not interested/lack of cadavers/others
- Have you ever seen dead bodies before? Yes/No
- Were you shocked to see the dead body for first time? Yes/No
- Did you get nightmare about the body? Yes/No
- Did you find dissection exciting? Yes/No
- Do you prepare mentally for dissection of cadaver? Yes/No
- Did you experience the formalin odour after your first encounter with cadaver, even when away from college? Yes/No
- Does cadaver dissection made anatomy easier to understand? Yes/No
- Should cadaver dissection be replaced by plastic models? Yes/No
- Do you feel dissection by yourself is more helpful than demonstration of prosected parts? Yes/No
- Is dissection essential for anatomy? Yes/No

Table 1: Religion

Hindu	260 (94%)
Muslim	12 (4%)
Christian	6 (2%)
Others	0

Table 2: Dissection performance

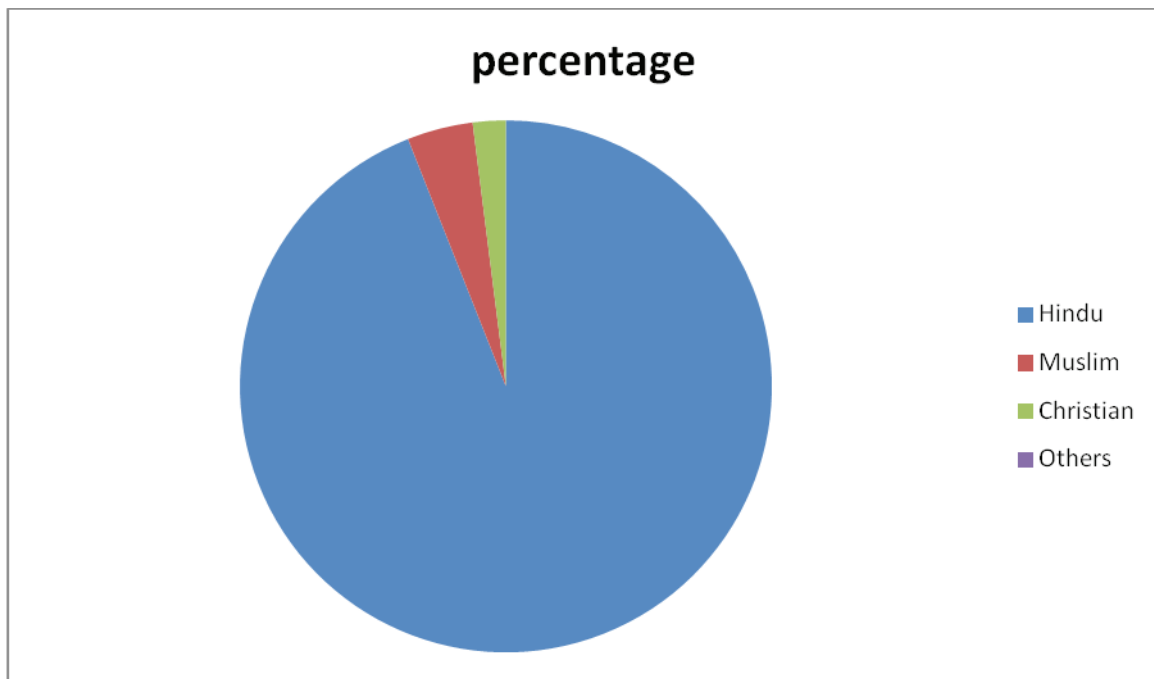
Yes	60 (21.58%)
No	218 (78.41%)

Table 3: Reasons for not doing dissection

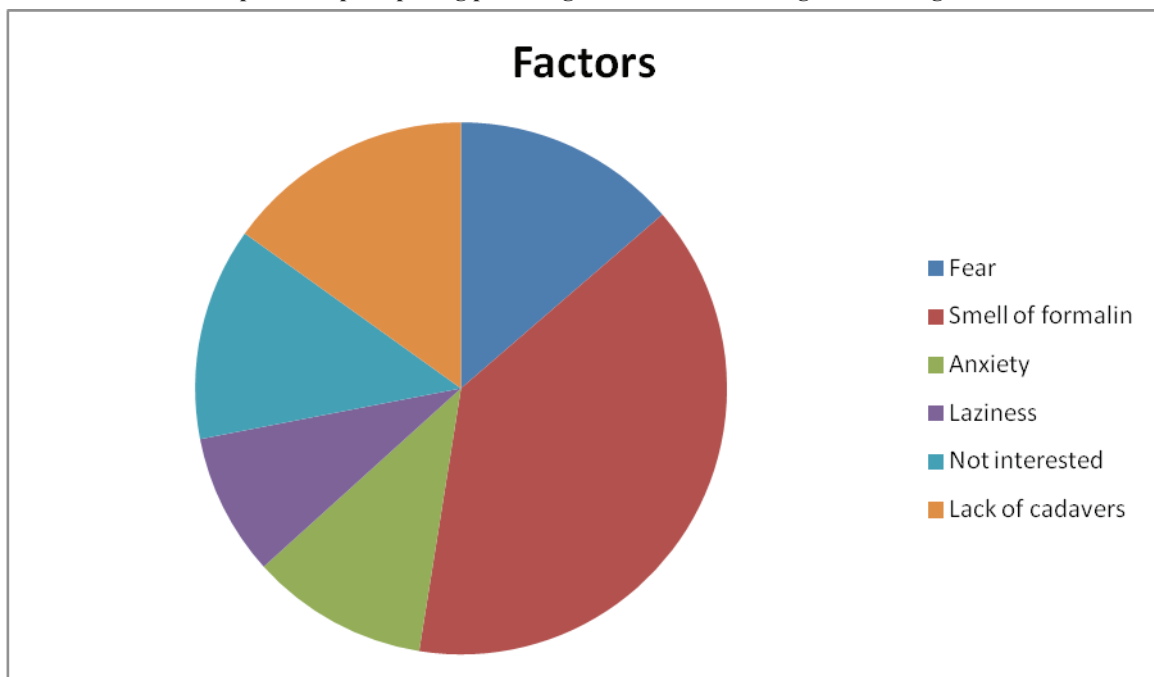
Fear	38 (13.66%)
Smell of formaldehyde	108 (38.85%)
Anxiety	30 (10.79%)
Laziness	24 (8.63%)
Not interested	36 (12.95%)
Lack of adequate no. of cadavers	42 (15.11%)

Table 4: Response to the questionnaire

	Yes	No
Have you ever seen dead bodies before?	88 (31.65%)	190 (68.34%)
Were you shocked to see the dead body for first time?	50 (17.98%)	228 (82.01%)
Did you get nightmare about the body?	66 (23.74%)	212 (76.26%)
Did you find dissection exciting?	190 (68.34%)	88 (31.65%)
Do you prepare mentally for dissection of cadaver?	30 (10.79%)	248 (89.21%)
Did you experience the formalin odour after your first encounter with cadaver, even when away from college?	136 (48.92%)	142 (51.08%)
Does cadaver dissection made anatomy easier to understand?	240 (86.33%)	38 (13.67%)
Should cadaver dissection be replaced by plastic models?	88 (31.65%)	190 (68.34%)
Do you feel dissection by yourself is more helpful than demonstration of prosected parts?	214 (76.98%)	64 (23.02%)
Is dissection essential for anatomy?	124 (44.6%)	154 (55.39%)



Graph 1: Graph depicting percentage of students according to their religion



Graph 2: Graph depicting different factors preventing students from doing dissection

Discussion

The study reveals that only 21.58% of students have done dissection while a large no. of them are not dissecting. A study done by Sharma et al.¹ showed that 35% of students were dissecting. So, the results are not very contrasting. There were so many causes that expel the students from doing the dissection. Most prevalent

cause was smell of formaldehyde (38.85%) as it causes irritation and gives unpleasant odour. The study of Sharma and Gupta et al.¹ showed the same result. But in that case, the prevalence was 50.7%. This is a factor that students have to accept and get habituated to it. Because, formalin is the most common and most effective chemical to preserve the cadaver. Study of Nirmalya Saha *et al*²

showed that about 64% of the students experienced the formalin odour even when away from the college. In this case, about 48.92% students feel that. Monika Lalit *et al*¹¹ reported that 52.17% students experienced the formalin odor even when they are away from the college. Next factor was lack of adequate no. of cadavers. So, maximum students don't get a chance to dissect. With increase no. of colleges and increased no. of seats in each college, the demand for cadavers is shooting high. Public awareness and body donation programmes must be more aggressive in order to fulfill our needs. Other less common factors are anxiety, laziness and fear. To overcome this, the students need a proper counseling and motivation. They must learn first the importance of dissection preferably during orientation programme. 32% of students have previously seen the dead bodies, so they are not really shocked to see it for first time. They are mentally prepared for it. Parker¹³ reported that students with prior exposure with a dead body were better equipped to deal with issues surrounding death and are more aware of medical uncertainties. Other less common factors are anxiety (10.79%), laziness (8.63%) and fear (13.66%). Sharma *et al*.¹ found that anxiety and tremors of the hand was experienced by 13.84% of the students which was quite embarrassing. Also, Abu Hijleh *et al*⁹ reported that 46.5% of the students expressed some level of fear before dissections. To overcome this, the students need a proper counseling and motivation. They must learn first the importance of dissection preferably during orientation programme. 68.34% of students found human dissection very exciting. Studies done by Izunya *et al*.⁴, 2010, Mulu *et al*.⁵, 2010, Oyeyipo and Falana⁷, 2012 and by Rajkumari *et al*.³, 2008, Kemeir¹⁰, 2012, Khan and Mirza⁶, 2013 revealed that 85% students were very excited with their dissection experience. They also accept (86.33%) that dissecting the cadaver helps them to learn and remember the subject in a better way as it creates a visual and motor experience, but the study of Izunya *et al*.⁴ gives a different picture. Still 31.65% students believe that cadaveric dissection can be replaced by plastic models. Because unlike cadavers, in plastic models, the relation is not distorted with time. They can also be used time and again. This gives ample opportunity to most of the students to see the relations properly. Those students who can't perform dissection due to lack of cadavers, it can be solved by synthetic models. So, we believe,

though plastic models should not replace dissection, but they should be there as a helping hand. With the availability of virtual study table, the radiological study, the cross sectional views are at our reach. Still students prefer dissection to demonstration of dissected specimen as it gives a better three dimensional approach. The same fact was observed by the study done by Rajkumari and Singh *et al*.³ 2010

Conclusion

So, students should be more motivated and they should be counseled properly about the importance of cadaveric dissection. Though there are other modalities available, but cadaveric dissection is irreplaceable. It gives a visuo-motor and psycho-motor impact on the subject. Cadaver acquisition procedures should be more streamlined, so that "lack of cadavers issue" is solved.

Ethical Clearance: Taken from Ethical Committee, Siksha 'O' Anusandhan University, Bhubaneswar

Conflict of Interest: Nil

Source of Funding: Self

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Physical Therapy Approach in Conjunction with Dry Needling on Health Related Quality of Life in Patients with Temporomandibular Disorder: A Randomized Control Trial

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Abstract

Introduction: Temporomandibular disorders (TMD) are one of the commonest musculoskeletal problems in physical therapy practice. This is not only a problem of temporomandibular joint but also affect the whole nervous system. The main purpose of this study was to assess the effectiveness of physical therapy approach on quality of life in TMD patients. **Methods:** The design of the study was randomized control trail where 200 subjects with both the gender, aged between 18 to 50 years who were clinically diagnose with TMD in the Department of Physiotherapy, Lovely Professional University, Punjab. India. After preliminary assessment all the subjects were assigned into two groups namely control group and experimental group. For outcome measurement short form of health related questionnaire (SF-36) was used to assess quality of life. In this study control group was received normal home based exercise and experimental group was received physical therapy approach which consists of dry needling, muscular inhibition in combination with home based exercise. **Results:** The experimental group to whom physical therapy protocol was applied associated with dry needling was shown significant increased scores in all the domains of the questionnaire. In control group where conventional physiotherapy was applied and improvement shown only in the domain of pain but not in the other parameters in comparison with experimental group. The level significant level was considered as $P < 0.05$ for the analysis of data. **Conclusion:** The results of this study claimed that the application of a physical therapy protocol in association with dry needling was able to improve the health related quality of life in patients with temporomandibular disorders.

Keywords: Health related Quality of Life, Physical Therapy, Dry Needling, Temporomandibular Disorders.

Introduction

Now day's temporomandibular disorders (TMD) have turned into a one of the commonest problem among physical therapist as well as for dentist. [1] TMD is a cervico-canio-madibular dysfunction which not only affects the Temporomandibular joint but also affect the central nervous system. [2] The aetiology of this condition is considering "biomechanical, neuromuscular and biopsychosocial" and the condition can aggravate with emotional stress, bad posture, bad position of teeth, tooth loss, and various extrinsic and intrinsic changes of the structural components of the Temporomandibular joint. [3, 4, 5]

The main sign symptoms of TMD patients include pain in temporomandibular joint and/or muscle with or without reduced range of motion of temporomandibular joint. The symptoms included with TMD may lead a patient to changes their lifestyle due to problem in talking, impeding their ability to partake in discussing, problem in eating. This may be the responsible for the low quality of life. [6, 7, 8, 9] The American Academy of Craniomandibular Disorders (AACD) revealed that physical therapy helps to reduce neuromusculoskeletal pain, and restore the normal range of motion through alter the sensory input and reducing inflammation, coordinating and strengthening the muscular activity, and promoting repair and regeneration of the tissues. [10] A study conducted by Oliveira et al., and the result of the

study proposed that temporomandibular joint pain may impact negatively in patients with TMD. [3]

Quality of life is a broad, subjective, productive and polysomic concept which has been the subject of numerous studies in the Health area, especially directed towards people with chronic diseases, such as TMD. It is defined by the individual as an internal experience of satisfaction and well-being in their living process. [11, 12] As per the existing studies it is clear that the TMD condition is a multidimensional condition where all the components are involved. Therefore the treatment strategies require a broad multidisciplinary approach. Physical therapy in conjunction with dry needling having a vital role in the rehabilitation of these patients, since it provides pain relief, rehabilitates the neuromuscular system and restores the mandibular rest position and muscle coordination, therefore improving quality of life. [10, 13] Therefore, the main purpose of this research was to evaluate the effectiveness of a multimodal physiotherapy approach on health related quality of life in patient with TMD.

Materials and Method

The design of the study was randomized control trial where 200 subjects with both the gender, aged between 18 to 50 years who were clinically diagnose with TMD were participated in this study. All the data were obtained from the Department of Physiotherapy, Lovely Professional University, Punjab. India. After preliminary assessment they were randomly divided into two groups by using lottery method namely control group (100 subjects) and experimental group (100 subjects). Control group was received conventional physiotherapy with normal home based exercise and experimental group was received physical therapy approach made of muscular inhibition technique, dry needling and home based exercise which sets out the principles for human research protocol. [14] The study was approved by the Institutional Research Ethics Committee of the Lovely Professional University (LPU/IEC/2019/01/05) and the clinical trial registration number of the study is CTRI/2019/06/019858. All the subjects were informed about the study and written consent form was signed by the participant.

The participants were included for the study, pain and positive three finger test with limited MMO of less than 30mm (but not necessarily painful) clearly originating in

the TMJ. Those who are suffering any dental problem, headache, hypertension, diabetes, asthma, epilepsy, and trauma and surgery to the maxillofacial area were excluded from the study.

For outcome measurement short form of health related questionnaire (SF-36) was used to assess quality of life. [15] The data was collected before starting the intervention and after four weeks of treatment protocol. The SF-36 is a generic instrument composed of 36 questions and divided into eight domains: “functional capacity, limitations due to physical aspects, pain, general health status, vitality, social aspects, emotional aspects, and mental health,” with these dimensions representing basic human values relevant to the assessment of the quality of life of the general population.

Intervention

The dry needling and muscle inhibition technique were given to the experimental group where dry needling was performed on masseter, temporalis and sub-occipital muscle for first weeks for three session the in the second week muscle inhibition technique were performed for medial and lateral pterygoid, masseter, temporalis, as well as for sub-occipital muscle. Before using the dry needling the skin surfaces was cleaned by saline water the a plastic guided 40mm acupuncture needle was insert in to the tender point of the muscle and for muscle inhibition technique, ischemic sustained pressure applied on the muscle for 5-10 second. In the 3rd and 4th weeks supervised exercise were performed. The conventional physiotherapy treatment protocol received by the control group was performed twice weekly for a total of eight sessions for 4 weeks with a duration of 10 minutes of ultrasound therapy. The Biomed brand ultrasound modality was used with the dosages of continuous mode of 3MHz with the intensity of 0.6 W/cm². [16]

Data Analysis

Data was analyzed by using SPSS version 16.0. Total 200 subject's data were analyzed. Within the group comparison pair t-test and between the group comparisons unpaired t-test was used. Level of significance for this study was fixed at 5% (P<0.05).

Results

In the descriptive demographic data, no significant difference was found [Table-1]. There was a significant change in the experimental group for all the parameters of quality of life after the intervention [Table-2] but in the control group only changes found in the pain domain [Table-3]. When the post intervention data were compared between the groups, it was found that in all the parameters of experimental group were significantly different than the control group.

Table 1: Demographic characteristic of data for Control and Experimental Group

Variables	Control group	Experimental Group
	Mean \pm SD	Mean \pm SD
Age(y)	35 \pm 10.11	36 \pm 12.12
Weight(kg)	66.22 \pm 5.93	67.32 \pm 7.58
Height(cm)	163.34 \pm 8.52	164.33 \pm 7.24
Gender	Female (n=68) Male (n=32)	Female(n=70) Male (n=30)
Body mass Index(kg/m ²)	22.55 \pm 3.65	23.32 \pm 3.15

Note: y=year, kg=kilogram, cm=centimeter, m=meter

Table: 2 Comparison of health related quality of life within the control and experimental group

Group	Outcome	Pre (Mean \pm SD)	Post (Mean \pm SD)	Differences within the group	p-value
Control Group	PF	58.67 \pm 9.00	57.86 \pm 8.53	1.19	.341
	RL-PH	36.49 \pm 19.18	32.62 \pm 16.83	1.13	.441
	RL-EH	34.07 \pm 24.31	33.07 \pm 22.23	1.00	.487
	ENERGY	51.89 \pm 8.27	50.27 \pm 7.72	1.38	.342
	EWB	62.91 \pm 6.50	64.49 \pm 8.76	1.58	.233
	SF	61.73 \pm 9.77	63.37 \pm 11.56	2.64	.435
	BP	44.29 \pm 9.01	62.62 \pm 9.37	18.33	.001
	GH	54.59 \pm 7.67	53.45 \pm 9.49	1.86	.543
Experimental Group	PF	58.91 \pm 9.87	87.83 \pm 6.81	28.92	.0001
	RL-PH	35.81 \pm 16.18	86.48 \pm 13.93	50.67	.0001
	RL-EH	32.37 \pm 25.56	83.94 \pm 16.72	51.57	.0001
	EN	48.94 \pm 12.03	84.00 \pm 8.91	35.06	.0001
	EWB	60.97 \pm 7.95	83.62 \pm 5.88	22.65	.0001
	SF	60.89 \pm 8.23	83.95 \pm 10.56	23.06	.0001
	BP	43.59 \pm 12.06	83.32 \pm 12.58	39.37	.0001
	GH	55.81 \pm 8.54	86.62 \pm 9.72	30.81	.0001

NOTE. PF= Physical functioning, RL-PH= Role of limitation Physical health, RL-EH= Role of limitation emotional health, EN= Energy. EWB= Emotional well-being, SF= social life, BP= Body pain, GH= General health,

Table: 3 Un-paired t-tests for quality of life

Variables	Control Group	Experimental Group	p-value
	Post (Mean± SD)	Post (Mean± SD)	
PF	57.86±8.53	87.83±6.81	.0001
RL-PH	32.62±16.83	86.48±13.93	.0001
RL-EH	33.07±22.23	83.94±16.72	.0001
ENERGY	50.27±7.72	84.00±8.91	.0001
EWB	64.49±8.76	83.62±5.88	.0001
SF	63.37±11.56	83.95±10.56	.0001
BP	62.62±9.37	83.32±12.58	.0001
GH	53.45±9.49	86.62±9.72	.0001

NOTE. PF= Physical functioning, RL-PH= Role of limitation Physical health, RL-EH= Role of limitation emotional health, EN= Energy. EWB= Emotional wellbeing, SF= social life, BP= Body pain, GH= General health

Discussion

The result of the study showed that manual physical therapy is effective against TMD. The main purpose of this study was to evaluate the effectiveness of manual physical therapy in conjunction with dry needling to improve quality of life in patients with TMD. In this study experimental group was shown a significant improvement in all the parameter of SF-36. The result showed that there is a significant improvement in quality of life in all domains for experimental group as compare with control group. In the control group very minimal amount of improvement shown in health related quality of life for all the parameters except the domain of pain. It is because; the study found that therapeutic ultrasound has a healing effect which can effect on the pain reduction. [24] Where in experimental group, improvement shown in physical functioning 28 points, role of limitations due to physical health 50 points, role of limitations due to emotional health 51 points, energy 35 points, emotional well-being 22 points, social life 23 points, bodily pain 39 points, general health 30 points.

A retrospective study conducted by Matta et, al. [17] and conclude that multidisciplinary approach is compulsory to treat the TMD patient. They also suggest that physical modalities only can reduce the symptoms for promoting a better quality of outcome interdisciplinary approach is required. Another similar study was done by Felício et, al. in 2008, where SF-36

questionnaire was used and shown that physical therapy approach is capable to improve the quality of life in patient with TMD. [18]

Study suggested that the relaxed, gentle and gradual stimulus of the fascia and the Ruffini endings within caused the subsequent instigation of the parasympathetic nervous system, which, in turn, caused a reduction in blood pressure. [19] Kim et al. [20] observed a decrease in stress hormone (known as a cortisol) levels following self-myofascial release and it was attributed to the suppression of the sympathetic nervous system through relaxation of the fascia. Hence, it can be assumed that the relaxation of the fascia can cause instigation of the parasympathetic nervous system and decrease blood pressure and pulse rate. In addition, MFR stimulate the mechanoreceptor which creates the balance of the autonomic nervous system mechanoreceptors [21] and another author said that stretching of the deep fascia surrounding the internal organs, causing a release of neurotransmitters which can affect the cardiovascular system. [22]

It is observed that multidimensional treatment approach for multifactorial disease is still lacking in physical therapy practice for the TMD management. [23, 24] Because in the physical therapy practice only some traditional manual therapy technique like mobilization, manipulation etc. but very less study with weak methodology found that multidisciplinary approach.

The present study was a multidimensional approach where improvement has shown in all the parameters. In this context, in control group also shown reduction of pain domain, therefore ultrasound can be effective modalities to reduce pain in patient with TMD, especially for those who are suffering acute TMD with persistent pain.

Conclusion

The results of the study showed that manual physical therapy in conjunction with dry needling treatment is beneficial to improve quality of life in patients with TMD. It was concluded that the dry needling can be a part of a physical therapy management protocol for better management of patients with TMD.

Source of Funding- Self funding

Conflict of Interest: Author does not have any conflict of interest

Ethical Clearance-Institutional research and institutional ethical committee approval were obtained before recruiting the patient (LPU/IEC/2019/01/05) for the proposed study.

CTRI Registration Number

-CTRI/2019/06/019858

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Current Radiographic Practices and Radiation Dose Evaluation

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Abstract

To investigate the current radiographic practices in a public tertiary care teaching hospital in digital radiography set-up, the study aimed to calculate the entrance surface air kerma (ESAK), kerma area product (PKA), and effective doses in chest PA, and AP digital radiographic examinations. Chest radiography is the most common examination performed worldwide. Due to the frequency of these examinations, its contribution to the collective dose is considerable. Also, various international authorities have recommended guidelines for local dose surveys for radiation protection and optimization. IAEA recommended protocol was used to calculate the patient doses. The 3rd quartile values of ESAK and PKA obtained are 0.17 mGy and 0.27 Gy cm^2 for chest PA; 0.38mGy and 0.21 Gy cm^2 for chest AP. The estimated mean effective doses are 0.017 (ED from ESAK), 0.037 (ED from PKA) for chest PA and 0.041 (ED from ESAK), 0.028 (ED from PKA) for chest AP. The results obtained are compared with ESAK, PKA, and effective dose values of previously published literature. The estimated doses could be used as a baseline value for setting up of future local diagnostic reference levels (LDRLs) and for optimization of patient doses in diagnostic radiology.

Keywords: Radiation dose, Chest X-ray, Kerma area product, entrance surface air kerma, effective dose, digital radiography, diagnostic reference levels.

Introduction

Ionizing radiation from medical X-ray exposures contributes largely to the public exposures from man-made radiation sources. X-rays serve as a valuable tool for diagnosis in medicine.¹ However, a major concern remains the radiation risk from these exposures. Benefits from these exposures must outweigh the associated

risks. Therefore it is crucial to justify and optimize each exposure without limiting the diagnostic information from the radiographs. Internationally many efforts are taken for radiation protection.² Dose surveys and patient dose monitoring is recommended by various national and international authorities and organizations such as Atomic Energy Regulatory Board (AERB), European Commission (EC), National Radiological Protection Board (NRPB), International Commission on Radiological Protection (ICRP), and International Atomic Energy Agency (IAEA). They have proposed guidelines and regulations for radiation protection of patients. They have also recommended the establishment of diagnostic reference levels (DRLs) for patient dose management.³⁻⁷ DRLs can be described as an investigation level or a dose quantity intended to identify abnormally high radiation doses during radiological examinations. These guidance levels represent a state of practice and are not expected to exceed the national

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diagnostic reference levels (NDRLs).⁸ Dosimetric measurements in diagnostic radiology are done by quantities namely KAP (kerma area product, PKA) and ESAK (entrance surface air kerma).⁹ The replacement of the film-screen system with the digital system has increased rapidly in Indian hospitals and diagnostic medical imaging centers. However, studies aiming to investigate local radiographic practices in digital radiography are limited.^{10, 11} Features associated with DR like post-processing and large dynamic range can influence the contrast and density of image and can result in overexposures without the knowledge of the operator.^{12, 13} Present study aims to examine the current state of radiographic practice in chest digital radiographic examinations in a public teaching hospital in Delhi, India. Chest radiographic examinations are the most commonly done diagnostic X-ray examination and contribute considerably to the collective dose.^{14, 15} ESAK and PKA were calculated in adult patients undergoing chest PA and AP radiographic examinations and effective doses (ED) were estimated from appropriate conversion coefficients. Obtained ESAK, PKA, and ED values were compared with corresponding international and national values published in the literature.

Method

71 adult patients (42 men and 29 women) who underwent chest PA and chest AP radiographic examinations participated in the study over a period of 2 months (November-December 2019). Radiation dose calculation was performed following the IAEA recommended protocol and weight criterion of (70 ±10) kg was applied while enrolling patients.¹⁶ Ethical approval was obtained from the institutional ethical committee (approval no: ECR/296/Indt/PB/2019/ISFCP/46). Pregnant patients were excluded. Patient's age, sex, weight, height, type of examination along with tube voltage (kVp), tube current (mA), exposure time (s), mAs, focus to detector distance (FDD) and patient thickness was recorded. Focus to skin distance (FSD) was obtained by subtracting patient thickness (t_p) and t_b (bucky thickness of 5 cm approximately) from the FDD (equation 1).¹³ Patient thickness (t_p) was measured with a caliper scale (least count of 0.1 cm) in the center of the X-ray beam. Patient radiation doses were calculated and effective doses were estimated in chest radiographic examinations.

$$FSD = d_{FDD} - t_p - t_b \quad (1)$$

Estimates of ESAK, PKA and, Effective dose

The ESAK was determined (equation 2) from the tube output and recorded exposure factors during the X-ray examinations as described in international protocols.

$$ESAK = OT \times (\text{mGy/mAs}) \times \text{mAs} \times (100/FSD)^2 \times \text{BSF} \quad (2)$$

Where, ESAK corresponds to entrance surface air kerma, OT is tube output in mGy/mAs, mAs is tube current x exposure time, FSD is the patient thickness and BSF is the backscatter factor. Appropriate backscatter factors can be found in the IAEA Technical Report Series No. 457.¹⁶ Once the ESAK was determined, the effective dose (equation 3) per radiological projection was evaluated using conversion coefficients from UK HPA -012 which were obtained using tissue weighting factors from ICRP -103.¹⁷

$$E \text{ (mSv)} = CC_{ESAK} \text{ (mSv/mGy)} \times ESAK \text{ (mGy)} \quad (3)$$

Where CC_{ESAK} corresponds to ESAK to an effective dose conversion coefficient.

Kerma area product measurements were carried with the use of a calibrated KAP meter, attached to the surface of X-ray tube collimator.¹⁸ An effective dose from P_{KA} was determined from equation (4).

$$E \text{ (mSv)} = P_{KA} \text{ (Gy. cm}^2\text{)} \times CC_{P_{KA}} \text{ (mSvGy}^{-1}\text{ cm}^{-2}\text{)} \quad (4)$$

Estimation of effective doses was done based on recorded P_{KA} using appropriate conversion coefficients (P_{KA} to effective dose), published by Wall et al. (0.16 mSv/Gycm²).¹⁹ Descriptive statistics of the collected data were performed in SPSS statistics 23.0 for windows. The results were compared with corresponding ESAK, P_{KA} , and effective dose values published in the literature.

Results

Patient demographic information and technical parameters are presented in table 1. FDD used for chest PA was 180cm and chest AP was 100 cm. Field size came out to be 32.15*35.64 cm² for chest PA and

29.96*34.5 cm² for chest AP. For chest PA the mAs ranged from 1.07-4.55 and for chest AP the mAs ranged from 0.81-1.97. The linear relationship observed between mAs and ESAK is presented in figure 1 with R² values. Table 2: Presents ESAK, PKA, and effective dose values obtained in this study (mean ±SD, median, 25th, and 75th percentile values). Table 3 presents a comparison between 3rd quartile values of P_{KA} and ESAK values for digital radiography obtained in this study with published dose reference levels (LDRLs and NDRLs). Table 4: Comparison between obtained effective doses in this study with published dose reference levels (LDRLs and NDRLs).

Table 1: Demographic and technical parameters

Exam - nation	No. of exposures (n)	Gender		Age (years)		Weight (kg)		Height (cm)		BMI (kg/m ²)	Patient thickness (cm)	FSD (cm)		kV	mAs
		M	F	mean	range	mean	range	mean	range			mean	range		
Chest PA	47	28	19	37.7	20-70	67.2	60-80	162	135-180	25.77	11.7	163.2	159-168	120	2.35
Chest AP	24	14	10	36.0	22-75	67.3	60-80	163	149-181	25.33	11.9	163.1	161-168	120	1.44

Table 2: Presents ESAK, PKA and effective dose values obtained in this study

Examination	mean ± SD	Min- max	25 percentile	Median	75 percentile
ESAK (mGy)					
Chest PA	0.13 ± 0.04	0.06 - 0.27	0.1	0.12	0.17
Chest AP	0.31 ± 0.07	0.16 - 0.46	0.25	0.31	0.38
Effective Dose E D (mSv): ESAK					
Chest PA	0.017±0.006	0.01 - 0.04	-	0.016	0.022
Chest AP	0.041±0.009	0.02 - 0.06	-	0.04	0.05
PKA(Gycm²)					
Chest PA	0.23± 0.08	0.1-0.45	0.16	0.21	0.27
Chest AP	0.17± 0.04	0.1-0.24	0.16	0.17	0.21
Effective Dose E D (mSv): PKA					
Chest PA	0.037±0.013	0.02-0.07		0.035	0.044

Chest AP	0.028±0.006	0.02-0.04		0.027	0.034
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Table 3: Comparison between 3rd quartile values of P_{KA} and ESAK values for digital radiography obtained in this study with published dose reference levels

ESAK (mGy)	mean ± SD	75 percentile	Hart et al ¹² 2010 UK-HPA-034 75 percentile	Suliman ¹³ 2019 Oman 75 percentile	Bhupendra et al ¹⁰ 2018 India 75 percentile	Satish et al ¹¹ 2017 India 75 percentile	Marco et al ²⁰ 2008 Brazil 75 percentile
Chest PA	0.13 ± 0.04	0.17	0.15	0.2	0.39	0.43	0.24
PKA (Gycm2)	mean ± SD	75 percentile	Hart et al ¹² 2010 UK-HPA-034 75 percentile	Metaxas et al ²² 2018 Greece 75 percentile	Metaxas et al ²³ 2018 Greece 75 percentile	Zhang & Chu ²⁵ 2012 China Mean	EC ²⁶ 2014
Chest PA	0.23± 0.08	0.27	0.1	0.1	0.08	0.11	0.16

Table 4: Comparison between obtained effective doses in this study with published dose reference levels.

E D (mSv): ESAK	Present study 2020		UK ²⁷ 2011	John et al ²⁸ 2006	Suliman ¹³ 2019
	mean	median	mean	mean	median
Chest PA	0.017	0.016	0.014	0.023	0.017
E D (mSv): PKA			UK ²⁷ 2011	Metaxas et al ²²	Metaxas et al ²³
	mean	median	mean	mean	mean
Chest PA	0.037	0.035	0.014	0.01	0.01

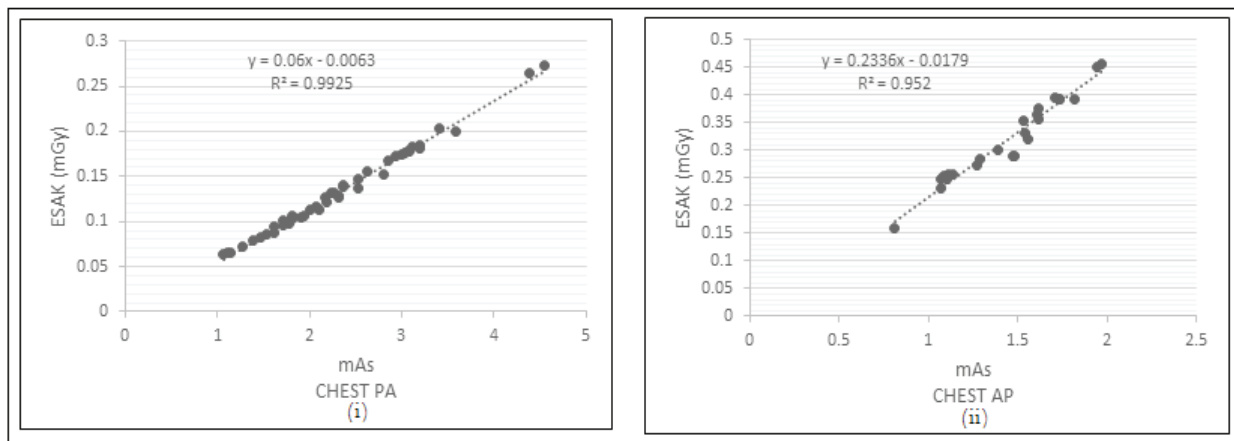


Figure 1: The relationship (linear) between exposure factor mAs and ESAK (mGy)

Discussion

Dose surveys help in understanding the current practices in radiographic examinations, its comparison with other hospitals, the scope of dose optimization, and ultimately patient dose reduction. It is observed that the ESAK values of chest PA are lower with the earlier studies of LDRL values reported by Suliman in Oman, LDRLs reported by Bhupendra et al and Satish et al in India and, Macro et al in Brazil and comparable with UK 2010.^{10-13, 20} For chest PA, the percentage decrease of radiation dose is found to be 15%, 56%, 60% 29% with Suliman, Bhupendra et al, Satish et al, and Marco et al respectively.^{10,11,13,20} The LDRLs reported by Suliman and Bhupendra et al are in digital radiography.^{10,13} The study by Macro et al is in film-screen radiography, a study by Satish et al presented DRLs via a dose survey of mixed type of X-ray machines, i.e. 64% conventional, 31% computed, and 5% digital radiography. Lower doses of the present study are due to practicing high kVp and low mAs technique in digital radiography. Observed kVp in chest PA is 120 and mAs is 2.35. Increased filtration is another reason for lower doses along with the inclusion of patients with weight range close to reference patients, as reported by Metaxas et al in Greece.²²

The P_{KA} (3rd quartile) values for chest PA in the present study came out to be 0.27 Gy cm^2 , which is comparable and higher than UK 2010, and two studies in Greece by Metaxas et al.^{12, 22, 23} This difference can be attributed to the difference in technology of radiography systems on which data was collected, different patient demographics and different radiographic techniques adopted by radiographers. Also, this study presents LDRLs in a single hospital only. A higher kVp, mAs, and filtration were observed in UK 2010 in comparison with the present study.¹² For chest PA, a high kVp low mAs (120 kVp, 2.3 mAs) technique and increased filtration were used, but still, the P_{KA} doses were significantly higher than UK 2010, this difference can be attributed towards radiographic practices with digital radiography, with decreased use of collimating field of view and resulting in larger exposed areas.²⁴ The observed ESAK of chest AP came out to be 0.38, which is nearly double that of UK- 2010 (034).¹² PKA came out to be 0.21 which is 40% higher than UK 2010. The observed higher values chest PA and AP shows the need for further optimization of radiation doses.^{12,}

¹⁵ The results of this study provide baseline values for dose optimization in digital radiography and show that regular monitoring of patient radiation doses should be encouraged for radiation protection of patients.

Conclusion

The study aimed to calculate the ESAK, PKA, and effective dose values in chest PA, and AP digital radiographic examinations. The results obtained are compared with ESAK, PKA, and effective dose values of previously published literature. Dose surveys for common radiological investigations will help in improving examination techniques. The estimated doses could be used as a baseline value for future LDRLs and for investigating radiographic practices to further help in the optimization of patient doses in diagnostic radiology.

Compliance with ethical standards

Conflict of interest: The authors declare no conflict of interest

Funding Source: None

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Family Interaction Pattern in Wive's of Alcohol Dependents

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Abstract

Introduction: Alcoholism is a disease which affects the individual and their family hence it is known as a family disease. Alcoholism reflects on the family bonds and it often leads to the complete breakdown of the entire family. The most affected persons are the wives of alcoholics because of their commonly nature and the intimacy in their relationships. The spouses of alcoholics facing severe domestic, financial and emotional violence which leads major psychological problems like anxiety, depression and poor self-esteem. Family interaction pattern (FIP) is defined as methods by which members of the family relate to each other through various mechanisms binding them in the bond of family.

Aim: This research work has made an attempt to study the Family interaction pattern in wive's of alcohol dependents. This study to measure the level of family interaction pattern and significant factors associated with wive's of alcohol dependents of Kottayam district of Kerala, India. **Result:** Nearly half of the respondents (37%) have medium level of Family interaction pattern. 33% have high family interaction pattern and 30% have low level of family interaction pattern. The study reveals that FIP Score has significant difference with the variables like age, area of residence, education and duration of drinking habit in spouses. The post hoc test indicates that respondents between the age group of 31-40 years, rural area of residence, educated below 10th standard and above 10 years of drinking habit in spouses have better FIP. Religion, type of family, occupation and family monthly income has no significance. **Conclusion:** This study inspires in realizing the mental, social, marital and family relation among wive's of alcoholics and it will be a great help in promoting family counselling programmes in de- addiction centres.

Key words: Alcoholism, Alcohol dependents, Wives, Family interaction pattern.

Introduction

Alcoholism is one of the major health and social problems around the world, which results in 3.3 million deaths in every year (WHO, 2018)¹. Alcohol consumption is the world's third largest risk factor for several disease and disability in the world today. Since India has the second largest population in the world the magnitude of the problem of "Alcoholism" is also very

high in India, and as per WHO 33% of India's population is alcoholics. It is also seen an annual rise in the number of people who use alcohol (WHO, 2010)². Alcoholism is a major cause of mental, social, family and health problems in Kerala. The state of Kerala has the highest per capita alcohol consumption in India, at over 8 litres per person per year³.

Alcohol addiction can be considered as a family problem and this contributes to the increased stress in the family. Family failure and breakage due to alcoholism is a serious pervasive social issue. Alcohol is connected with domestic violence, low satisfaction in the relations, relationship conflicts, under care of children, legal and economic issues, disrupted family interaction etc. and some also results in physical and psychological illness⁴. Researcher observed that the

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actual sufferers are the members of family who depends upon the alcoholic, particularly the spouse. The wives of alcoholics often shows many mental and physical problems, their social involvement will be very low and low level of marital satisfaction. Even these people have very bad communication level also⁵. The spouses of alcoholics have psychological issues in various adaptive and maladaptive coping mechanisms, to restore the equilibrium and to relieve stress.

Family is the basic and fundamental part in the society. And several families contribute to form a society. The health of a nation can be measured only in terms of health of a family. Addiction affects mostly the spouse in the family as the family income is spent on liquor and the spouse is compelled to manage family finance and needs. There exist fear and uncertainty which leads to lack of self-esteem and self-confidence. Spouses of alcohol dependent person may have feelings of guilt, shame, anger, fear, grief, avoidance of social contacts and isolation due to the presence of an alcohol dependent in the family. They are often subjected to moderate to severe form of harassment. Conflict and tense atmosphere arises when they confront the drinking behaviour of their alcohol abusing family member. The problems that arise as a result of alcohol abuse is numerous, which includes long absences from home, destroying house hold and domestic items, no communication, isolation, domestic violence etc. these people are least bothered of the happenings in their family.

Alcoholism of husband results in the change in the interaction patterns of the wife and causes an alteration the complexion of family environment by financial resources of the family which intern results in the dysfunction of several other areas. The heavy stress experienced by wife in dealing with the pressure of her husband will always influence their marital life negatively. Almost all of the alcoholic dependents and their spouses agree that the main factor of marital happiness is related to family interaction and interpersonal relationship⁶.

Family interaction patterns are defined as those socio-psychological transactions occurring in the family as system to evolve processes for decision making, emotional expression, personal views, assigning tasks and social status, enabling the family members to

contribute to the growth of the family by generating morphogenesis at emotional, intellectual, and social levels by manipulation of external and internal milieu of the family as a whole. From the evolutionary point of view, every family has patterns of leadership, communication, role, reinforcement, cohesiveness and social support constituting its functioning.

Reinforcement: process adopted by the family to enable the members to imbibe socially approved behaviour. Social support system: manipulation of internal and external social milieu of the family for its existence and growth. Role: socio culturally prescribed and ascribed tasks to be performed by different family members according to their age and sex. Communication: Communication within the family is extremely important because it enables members to express their needs, wants, and concerns to each other. Cohesiveness: processes adopted by the family for a firm degree of mutual trust and interpersonal commitment. Leadership: A family member engaged in decision making through consensus for growth of the family, as a system is the leader of the family⁷.

The researcher visited various De-addiction centres in Kottayam district, Kerala and interacted with the spouse of alcoholics during the Al-anon programme (Al-anon group is a worldwide fellowship that offers a programme of recovery for the families and friends of alcoholics, whether or not the alcoholic recognizes the existence of a drinking problem or seeks help)⁸ and family counselling. The interaction with spouses and discussion with family counsellors of the de-addiction centres helped the researcher to find out the family interaction pattern of the respondents. Researcher came to know that the impact of alcoholism on marital family functioning and influences the family interaction.

Methodology

This paper is based on standardized scale and the data was collected with an interview schedule from wives of alcoholic attending family counselling and Al-anon meeting in a De-addiction centre of Kottayam district of Kerala. An interview schedule was used to collect data. Family interaction Pattern Scale (FIPS) developed by Bhatti et al (1986) is used for the study. The research is descriptive in nature. Census method used to collect the samples. The researcher collected data's from all

the respondents who were willing to participate in the study during the period of data collection (July 2019 – December 2019). The criterion for selection of the respondents was the wives living with the alcoholics who are under treatment at de-addiction centres in Kottayam District. 200 respondents were included in the study.

Major Findings:

The simple percentage of socio demographic data reveals the following information. It is seen that 30% of the respondents are in the 20-30 years age group. Nearly half of the respondents (49%) are Christian. More than half of the respondents (55%) are from rural area. More than half of the respondents (56%) are from nuclear family. Nearly half of the respondents (29%) have Under Graduate education. Nearly half of the respondents (29%) are unemployed spouses (housewives). Majority of the respondents (64%) have family monthly income above Rs.20000. Half of the respondents (50%) have

above 10 years of drinking habit in spouses. **Level of Family interaction pattern**

Nearly half of the respondents (37%) have medium level of Family interaction pattern. 33% have high family interaction pattern and 30% have low level of family interaction pattern.

Evidences show that severe alcoholism leads to marital problems and family conflict, and negative emotions and interpersonal interactions often lead to relapses among alcoholics. Stress from family and other relations will motivate them for more drinking. Family members of the alcoholic have medium level of communication as either of the spouses, children or parents is afraid to talk to each other. This is mainly due to the violent nature of the alcoholic where the family members limit their communication so as to avoid problems.

Factors affecting the Family interaction pattern

Table No. 1: ANOVA Test to compare Family Interaction Pattern (FIP) and Socio demographic profile

S.No.	Variables	F -value	Table value	Significant/Not
1	Age	4.230	3.883	**
2	Religion	0.196	3.048	NS
3	Area of residence	4.052	3.048	*
4	Type of family	0.946	3.042	NS
5	Education	3.482	3.113	**
6	Occupation	0.662	2.418	NS
7	Family monthly income	0.915	3.042	NS
8	Duration of habit in spouse	4.144	3.883	**

NS-Not significant, * -Significant at 5% level, ** -Significant at 1% level

1) FIP Score has significant difference with age. The post hoc test indicates that respondents are between the age group of 31-40 years have better FIP.

This study revealed that the family interaction pattern is more significant in spouses of alcoholics with age groups of 31-40 years than other age group.

It is because couple's given more concentration to their young children and when the child grown to teenage or above they leaves the home for studies, job.

2) FIP Score has significant difference with Area of residence. The post hoc test indicates that respondents who are from rural area of residence have better FIP.

The National Family Health Survey 2015-16(NFHS-4) reveals that the consumption of alcohol is higher in rural area than urban area in Kerala⁹. The study revealed that the FIP is significant in rural area than urban and sub urban areas. The significance is due to the influence of social support and interaction among the neighbours is higher in rural area than urban and sub urban areas. The women in the rural areas are gathering together once in a week for the “Kudumbashree Meeting” (a poverty eradication mission by Government of Kerala) which help them to share their problems with the peer group and find the solutions for the same.

There is a need of detailed study among the rural populations, mainly family centered people in order to have in-depth knowledge. On their particular needs and to contribute more to adopt public health measures for preventing these issues and promoting health and psychological rehabilitation. The problem of excessive alcohol consumption is a major cause of public health concern both in urban and rural areas.

3) FIP Score has significant difference with education. The post hoc test indicates that respondents were educated up to 0-9 standard (below 10th standard) has better FIP.

The FIP is higher in respondents below 10th standard education than the educated wives. As most of the respondents are from rural area, the culture of the society is more family oriented. The less educated respondents are more flexible to adjust with alcoholic habit of their spouses than the educated respondents. Hence the FIP is higher in this category. Some of the high income individuals are not highly educated. They are into business and earn lakhs of rupees and hence were found to lead a comfortable life with the satisfaction given by money¹⁰.

4) FIP Score has significant difference with Duration of habit in spouses. The post hoc test indicates that respondents whose husband's are drinking above 10 years have better FIP.

Analysis of the research shows that the FIP is higher in wives of alcoholics whose spouse's drinks alcohol for more than 10 years. On interaction with the respondents the researcher identified that most of the respondent's spouses who drinks alcohol for more than 10years have

more responsibility towards the family and spouses gives mental support to the alcoholics as they were adjusted with habit of the spouses. This helped them to reduce domestic violence and quarrels among them.

Discussion and Conclusion

Family education and family therapy will lead to solve the problem to a certain extent and other important is to educate the community. Adjustmental problem of wives of alcoholics affect their future generation. Mass media- information should be given about the ill effect of alcoholism. Family counselling or 12 steps therapy (AI-anon) will help the wives to recover from adjustmental problem, marital dissatisfaction and family interaction. De-addiction centres suggest a need to study the stress perceived by spouses of alcoholics and these centres recognized spouse of alcoholic's as an important components in the development of personality, marital conflict, maintenance relationship and treatment of psychological problems. Changes in the attitude and behaviour of the wives of alcoholics can be bought through various therapies like individual, family, musical, occupational etc. and also methods like yoga, meditation and relaxation techniques may contribute to their psychological improvement.

Conclusion

Nearly half of the respondents (37%) have medium level of Family interaction pattern. The study reveals that FIP Score has significant difference with age, area of residence, education and duration of drinking habit in spouses. The post hoc test indicates that respondents between the age group of 31-40 years, rural area of residence, below 10th standard education and above 10 years of drinking habit in spouses have better FIP.

Researcher observed that the social consequences of the wives of alcoholics at the individual level significantly impact on personal life, work related area and family relationship. They experience physical, social, economical and psychological problems like socially isolated, lost status in the society, anxiety, depression, loneliness, worthlessness, fear of being rejected etc. because of their husband's drinking. So many negative social consequences like very low self-esteem, disturbed family, social problems, recreational problems etc. are reported from the wives of alcohol

dependents. It is the responsibility of social workers to use social work intervention techniques and methods (psychotherapy for couples & family members, group therapy, counselling etc.) for improving their self esteem and better family interaction pattern.

- Marital satisfaction and stability is negatively affected because of excessive drinking.

- Discordant alcohol consumption is a prime factor in marital dissatisfaction.

- Treatment for the couples for alcoholism has given better outcome and greater satisfaction in marital life. This has also resulted in less partner violence.

- After family therapy, the openness, warmth, support and relationships became more effective and sharing of responsibilities is seen in the family.

- Practising problem-solving skills and additional behavioural skills help the couples to cope up with relapse episodes¹¹.

Ethical Clearance- Taken from Human Ethics Committee, Dept. Of Social work, Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India.

Source of Funding- Self

Conflict of Interest- Nil

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A retrospective study to assess the trends of Sexually Transmitted Infections among the patients attending Skin and STD OPD KIMS, Hubli

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Abstract

Background & Objectives: Sexually transmitted infections are on focus since the advent of HIV, as they contribute to the spread of the disease. To simplify the detection of STIs at the community level syndromic approach has been introduced. There is a shift in the trend of aetiology from bacterial to Viral. However the information available on these changing trends is very limited. The present retrospective study was conducted to study the trends of sexually transmitted infections in KIMS, Hubli.

Method: A retrospective study where data was collected from the previous records of patients attending Skin and STD OPD, KIMS Hubli. The data was entered in MS Excel and analysed using SPSS software.

Results: The study showed that prevalence of STI is highest in the age group of 25-44 years (56.54%), and among females (11.2%) with vaginal discharge being the most common presenting complaint (38.7%). The prevalence of HIV among patients attending skin & STD OPD, KIMS, Hubli was found to be 5.04% during the year 2012

Conclusion: The average prevalence of STI is 5.36% during years 2008-2012. There is an increase in the detection of HIV positive status among the patients attending skin & STD OPD, through the years.

Keywords: Sexually transmitted infections, trends, retrospective study

Introduction

Every year there are over 340 million new cases of sexually transmitted infections, 75–85% of them occurring in developing countries according to WHO.¹ 40 million new cases occur each year in India.¹

The sufferings of majority of women who had RTI are mainly because of complications like infertility,

pelvic inflammatory disease and cervical cancer.¹

With the advent of HIV, STDs have become one of the major public health problems.²

There is a huge impact of STDs on health and economics of a nation. HIV pandemic has forced to focus on the prevention of these diseases as they are the key factors in HIV transmission.³

Bacterial infections like syphilis and gonorrhoea were dominating in India during 1960s and 1970s. With the spread of HIV and the changing life style and behaviour have led to a rise in viral infections.⁴

The socio-demographic and clinical knowledge in STI population can contribute to the necessary changes in the improvement of already existing preventive

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programs.⁵

This retrospective study was carried out to determine the changing trends of STIs among the patients attending skin and STD OPD KIMS, HUBLI.

Methodology

The study was started with orientation to records maintained in skin and STD OPD, KIMS, Hubli. The records were maintained on monthly basis with entries of all cases attending with complaints of STI for whom various laboratory examinations were done for the diagnosis of STI.

Entries were made under the following headings:

- Name of the STD clinic/hospital.
- Reporting period- month and year.
- No. of patients availed STI services in the month.

- STI syndromic diagnosis.
- Details of other services provided to patients with STI complaints in this month.
- STI service provision HRGs in the month.
- ANC syphilis screening in the month.
- Laboratory diagnosis in the month.

The records from January 2008 to June 2012 were retrieved and data was collected and recorded systematically for all the patients of STI attending skin and STD OPD during this period.

The data was segregated and analysed. Various demographic factors were studied; the information was tabulated and interpreted. The data was presented as frequencies and percentages.

Results

Table 1: Table showing the total number of patients attending the skin and STD OPD for STIs at KIMS, Hubli

Year	Gender/ Total	No. of cases
2008	Male	10026
	Female	6371
	Total	16397
2009	Male	8544
	Female	5489
	Total	14033
2010	Male	6024
	Female	4630
	Total	10654
2011	Male	7158
	Female	5172
	Total	12330
2012	Male	3423
	Female	2354
	Total	5777

The above table shows the total number of STI cases attending Skin and STD OPD

Table 2: Prevalence Of STI among patients attending skin & STD OPD, KIMS, Hubli

Years	2008	2009	2010	2011	2012
Male	50	97	73	37	87
%	0.5	1.1	1.21	0.52	2.54
Female	43	59	699	517	686
%	0.67	1.07	15.1	10	29.14
Total	93	156	772	554	773
%	0.57	1.11	7.25	4.49	13.38

From the above table we can see that the prevalence of STI has gradually increased over a period of time to 13.38% in 2012.

Table 3: Table showing the difference in the STI trends according to age and gender

Age group	Years	Male	%	Female	%	Total	%
Less than 20 years	2009	5	3.2	0	0	5	3.2
	2010	1	0.13	57	7.38	58	7.51
	2011	0	0	13	2.33	13	2.33
	2012	1	0.13	36	4.65	37	4.78
20-24 years	2009	14	8.97	3	1.92	17	10.89
	2010	5	0.64	98	12.69	103	13.34
	2011	3	0.54	85	15.34	88	15.88
	2012	18	2.32	116	15	134	17.32
25-44 years	2009	56	35.85	46	29.48	102	65.38
	2010	51	6.61	367	47.54	418	54.15
	2011	26	4.69	294	53.06	320	57.75
	2012	40	5.17	415	53.68	455	58.85
More than 44 years	2009	22	14.1	10	6.41	32	20.51
	2010	18	2.33	143	18.52	161	20.85
	2011	12	2.16	106	19.13	118	21.23
	2012	28	3.62	119	15.39	147	19.01

From the data in the above table, we can see that majority of the patients of STIs were in the age group of 25-44 years in all the four years and in all the years females were the majority except for the year 2009 where males were more in number when compared to females (Table 3).

Table 4: Table showing the trends of Genital Herpetic Ulcer and Genital Non Herpetic Ulcer from 2008-2012

Lesion	Year	2008	2009	2010	2011	2012
Genital Herpetic Ulcer	Male	16	58	44	24	11
	%	17.2	37.17	5.7	4.33	1.42
	Female	16	20	30	18	5
	%	17.2	12.82	3.88	3.24	0.64
	Total	32	78	74	37	16
	%	34.4	49.99	9.58	6.67	2.06
Genital Non Herpetic Ulcer	Male	6	12	3	11	0
	%	6.45	7.69	0.38	1.98	0
	female	2	4	0	5	1
	%	2.15	2.56	0	0.9	0
	total	8	16	3	16	1
	%	8.6	10.25	0.38	2.88	0

Genital Herpetic ulcer was equal in both males and females during the year 2008 and after that more males were detected and the maximum number of cases detected was during the year 2009. Genital non herpetic ulcer was more common in males and in 2012 there was only one case. (Table 4)

Table 5: Symptomatology of the patients attending Skin and STD OPD, KIMS HUBLI.

Symptom	Years	2008	2009	2010	2011	2012
Lower abdomen Pain	Male	0	0	0	0	0
	%	0	0	0	0	0
	Female	0	0	244	177	129
	%	0	0	31.6	31.95	16.68
	Total	0	0	244	177	129
	%	0	0	31.6	31.95	16.68

Cont... Table 5: Symptomatology of the patients attending Skin and STD OPD, KIMS HUBLI.

Inguinal Bubo	Male	0	3	0	2	1
	%	0	1.92	0	0.36	0.13
	Female	2	0	0	0	0
	%	2.15	0	0	0	0
	Total	2	3	0	2	1
	%	2.15	1.92	0	0.36	0.13
Genital wart	Male	5	3	5	1	0
	%	5.37	1.92	0.64	0.18	0
	Female	3	6	0	0	1
	%	3.22	3.84	0	0	0.13
	Total	8	9	5	1	1
	%	8.6	5.76	0.64	0.18	0.13

Lower abdomen pain was the most common symptom among females during the years 2010 to 2012 (Table 5)

Table 6: Prevalence of HIV among patients attending skin & STD OPD, KIMS, Hubli

Year	2008	2009	2010	2011	2012
Male	0	7	6	4	12
%	0	4.48	0.77	0.72	1.54
Female	0	14	11	0	27
%	0	8.97	1.42	0	3.49
Total	0	21	17	4	39
%	0	13.46	2.19	0.72	5.04

5% of the total patients with STIs were found to be positive for HIV during the year 2012 which was 13.5% during the year 2009 (Table 6).

Discussion

In this study, we found that the prevalence of STI among the patients attending SKIN AND STI OPD, KIMS, Hubli is 5.36% during the study period JAN 2008 TO JUNE 2012. STI prevalence during each year is

- Ø 2008- 0.57%
- Ø 2009-1.11%
- Ø 2010-7.25%
- Ø 2011-4.49%
- Ø 2012-13.39%

The prevalence of STI is more in the age group 25 – 44 years (56.54%) which is different from a study conducted by Dr. V K Jain where 54 % of the patients with STI were 21-30 years.³

The prevalence of STI is high in females (11.2%) than males (1.17%) in contrast to the previous study made by Dr. V K Jain, et al. where the male:female ratio was found to be 5:1.³

And one more study conducted by T S Chandragupta et.al. was also in contrary to our study where majority were males and were in third decade of their life.⁶

In our present study, vaginal discharge is the most common syndrome with a prevalence of 53.68% in 2012 which was about 23.66% in 2008 which is similar to a study conducted by Sangeetha S Balamurugan (32.77%).¹

The second most common syndrome was lower abdominal pain with a prevalence of 26.7% in accordance with the similar study made by Sangeeta S Balamurugan (23.48 %).¹

The third most common STD was genital ulcer herpetic with prevalence about 20.54%.

The next in the list was AIDS with prevalence of 5.3%.

The next to follow were non herpetic genital ulcer (4.42%) and genital warts (3.06%).

There is a change in the trend of STIs as we can see a gradual rise in the cases of many viral infections with

increase in the detection of STIs by the health workers because of syndromic approach, many studies also show a similar trend of increasing Viral STIs.^{7,8}

More studies should be conducted to note the changes in the trends during the course of time to help in the improvement of the existing strategies followed.

Conclusion

In the retrospective study conducted the total prevalence of STI is found to be 5.36% and STIs are more prevalent in the age group of 25- 44 years. STIs are more prevalent among females than males with vaginal discharge being the most common syndrome.

Limitations

1. Data about socio economic status, religion and marital status was not available and could not differentiate between urban and rural population.
2. The population under the study could not be defined exactly since the hospital caters for a very large population from various regions of North Karnataka.
3. The results cannot be generalised to the community.

Recommendations

1. To conduct prospective studies to find out the trends of STIs, at community level.
2. To strengthen awareness about transmission of disease among the people more so among females.
3. To create awareness among people about the preventive measures.
4. Health campaigns should be conducted regularly by public health workers.
5. Promotion of female literacy.
6. Early diagnosis and prompt treatment must be encouraged.

Acknowledgement: The authors would like to thank the head of the department of Dermatology and Medical Records Department KIMS, Hubli for their cooperation in the conduct of the study.

Declaration

Funding: None

Conflict of Interest: None declared

Ethical Approval: Not required

Informed consent: “Informed consent was obtained from all individual participants included in the study.”

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Type of Article: Original Research Article

Assessment of Safety Practices of Pesticide Use among the Farmers in Adargunchi and Noolvi, Karnataka - A Cross Sectional Study

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Abstract

Background: Modern agricultural practices reveal an increase in the use of pesticides and fertilizers to meet the food demand of increasing population which results in more exposure of pesticide residues. Many of the pesticides have been associated with health and environmental hazards. Thus, understanding farmer's knowledge of pesticides and safety practices is vital to provide valuable information aimed at preventing or reducing the health hazards associated with it.

Objectives : To assess the awareness of the safety practices related to pesticide among the farmers and to identify the health problems associated with it.

Method: A cross sectional study was conducted among 150 farmers in Adargunchi and Noolvi of Dharwad district, Karnataka, in the month May and June 2014. A pretested, semi-structured questionnaire was used to collect data.

Results: 93% were not aware of the harmful effects of pesticide. 78% did not undergo any practical training related to pesticides. 70% did not take any precautions nor use any protective equipment. 59% suffered from one or the other ailment due to exposure to pesticides and only 5% have sought medical care.

Conclusion: Overall awareness of agricultural workers on pesticide was inadequate. The findings of the study emphasize the need to educate agricultural workers regarding safe and adequate use of pesticides to prevent health hazards.

Key Words: *Farmers, Awareness, Pesticides, Herbicides, Agricultural workers.*

Introduction

Pesticides are substances or mixtures of substances that are mainly used in agriculture or in public health protection programs in order to protect plants from pests, weeds or diseases, and humans from vector-

borne diseases, such as malaria, dengue fever, and schistosomiasis. Some of the typical examples includes; Insecticides, fungicides, herbicides, rodenticides, and plant growth regulators^(1, 2, 3).

India is largest manufacturer of basic pesticides in Asia and ranks 12th globally. The production of pesticides started in India in 1952 with the establishment of a plant for the production of BHC near Calcutta, and India is now the second largest manufacturer of pesticides in Asia after China⁽⁴⁾. The pattern of pesticide usage in India differed from that for the world in general where in India, 76% of the pesticide used is insecticide, as against 44% globally. The main use of pesticides in India is for

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cotton crops (45%), followed by paddy and wheat. The use of herbicides and fungicides is correspondingly less heavy (4, 5).

Because of the widespread use of agricultural chemicals in food production, people are exposed to low levels of pesticide residues. Many of the pesticides have been associated with health and environmental hazards (1, 2, 6-8), and the agricultural use of certain pesticides has been abandoned (2). Evidence also suggests that children are particularly susceptible to adverse effects from exposure to pesticides including neurodevelopment defects (9). No segment of the population is completely protected against exposure to pesticides and the potentially serious health effects, though a disproportionate burden is shouldered by the people of developing countries and by high risk groups in each country (1). The world-wide deaths and chronic diseases due to pesticide poisoning number about 1 million per year (10). The high occupational, accidental, or intentional exposure to pesticides can result in hospitalization and death (1, 11). Thus, understanding farmer's knowledge of pesticides and safety practices is vital to provide valuable information aimed at preventing or reducing the health hazards associated with pesticides. This study aims to study the awareness of the safety practices related to pesticides among the farmer and to identify the health problems associated with exposure to pesticides.

Objectives

To assess the awareness of the safety practices related to pesticides among the farmers

To identify the health problems associated with exposure to pesticides.

Method

This was a cross sectional study of conducted among the farmers in Adargunchi and Noolvi of Dharwad district, Karnataka, in the month May and June 2014. Convenient sampling method was used to collect the data and the total sample size included was 150.

Inclusion criteria – Labourers and Farmers exposed to pesticide who have given consent to participate in the study.

Data collection: The participants were briefed about the purpose of the study and informed written consent was taken and data was collected by in depth interview method with a pre-determined, pre-tested questionnaire in English and was asked in local language (Kannada) and details regarding pesticide usage, precautions taken, and health problems during exposure and awareness about harmful health effects of pesticides.

Data Analysis: The data collected was entered in Microsoft Excel and later analyzed using SPSS version 20. Chi-Square test was applied as test of significance and p-value of <0.05 was considered statistically significant.

Results

Table 1. Socio-demographic factors

Variables		No. of farmers	Percentage
Locality	Adargunchi	54	35.3
	Noolvi	96	0.7
Gender	Male	139	92.7
	Female	11	7.3
Religion	Hindu	135	90.0
	Muslim	15	10.0
Education	Literate	76	50.7
	Illiterate	74	49.3
Duration of farming	<5 years	5	3.4
	5 - 10 years	12	8.0
	>10 years	133	88.7

93% of the participants were males, about half of them (51.7%) were literate and 88% were BPL card holders. 89% of the study participants were cultivating for more than 10 years.

Table 2. Practices of the farmers

Variables		No. of farmers	Percentage
Practical training attended	Yes	33	22.0
	No	117	78.0
Method of usage	Mixed	95	63.3
	Separately	41	27.3
	Both	14	9.3
Storage at safe place	Yes	148	98.7
	No	2	1.3
Printed instruction followed	Yes	102	68.0
	No	48	32.0
Increased usage compared to previous years	Yes	87	58.0
	No	31	20.7
	Not considerably	32	21.3
Equipment used	Manual placement	2	1.3
	Sprayer	5	3.3
	Trigger pump	143	95.3
Frequency of usage per year	1	33	22.0
	2	77	51.3
	3	19	12.7
	4	17	11.3
	≥5	4	2.7
Visits in the field after application of pesticides	After few hours	77	51
	After few days	54	36
	After a week	19	13
Precautions taken during application	Yes	45	30.0
	No	105	70.0

78% of them were not practically trained. 64% mixed different pesticides and used, 41% uses separately and 14% uses both at a time. Almost all of them (99%) store the pesticides in a safe place. 68% of them follow printed instruction. 58% were opined that pesticide usage has been increased as compared to that of previous year. 95% of them use trigger pump for pesticides applications. 51% of used twice a year and few reported using ≥ 4 times a year. 51% goes to field immediately after the application and 70% do not take any precautionary measures while applying the pesticides (Table 2).

Most of the farmers use only masks and many of them did not use any kinds of personal protective devices (PPD) during application (Table 3). Majority of them (93%) were not aware of the harmful effects of pesticide. About 59% reported suffering from pesticide exposure on the day of exposure or on the next day. Majority (46%) had general health problems viz., headache malaise, fatigue etc. (Fig. 3) and 2% were hospitalized. Only 7% were aware of the harmful health effects of pesticide treated product consumption and only 5% of them have sought medical care.

Table 3. Types of PPD use during pesticides applications

Types of PPD*	No. of farmers	Percentage
Respirator	1	0.7
Mask	44	29.3
Boots	2	1.3
Gloves	11	7.3
Shield	3	2
Resistant clothing	2	1.3

* Personal protective devices

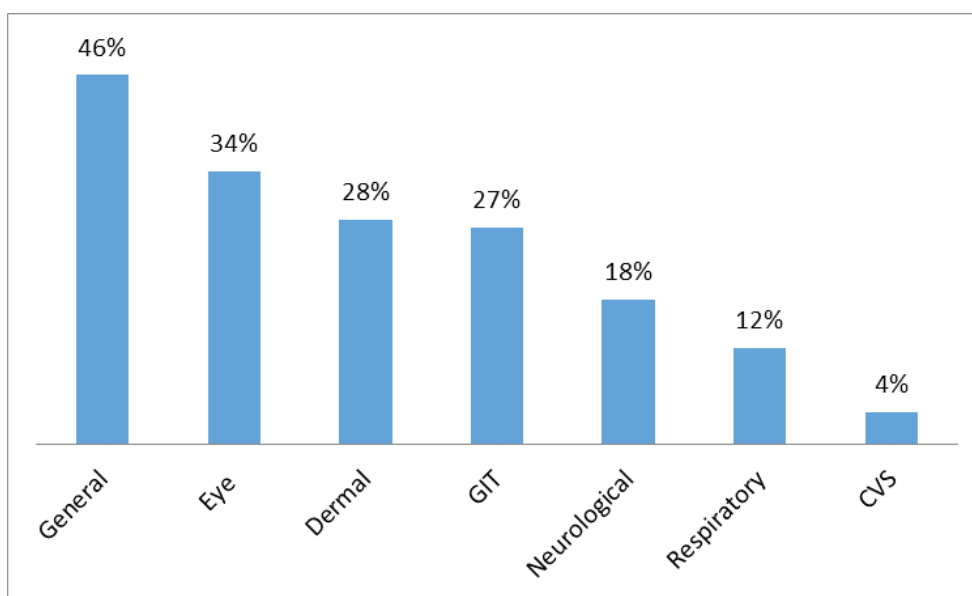


Figure 1. Self reported health problems due to exposures of pesticides

Majority (46%) of the participant complaints of general health problems viz., headache malaise, fatigue etc. after exposure to pesticides.

Table 4: Relation between literacy and health problems with precautions taken

Variables		Precautions		p- value
		Yes (%)	No (%)	
Literacy	Literate	27 (18%)	49 (32.7%)	>0.05
	Illiterate	18 (12%)	56 (37.3%)	
Health problems	Yes	34 (22.7%)	54 (36%)	<0.05
	No	11 (7.3%)	51 (34%)	

Those who were literate have better precautionary measures as compared to illiterate and but it not was found to be statistically significant (Table 4). Precautionary measures and health problems were found to be statistically associated ($p < 0.05$).

Table 5: Association between duration of cultivation with eye and dermal problems

Duration of cultivation	Eye problem		Dermal problem	
	Yes (%)	No (%)	Yes (%)	No (%)
< 5 years	2 (1.3)	3 (2%)	3 (2%)	2 (1.3%)
5 to 10 years	6 (4%)	6 (4%)	3 (2%)	9 6%
>10 years	44 (29.3%)	89 (59.3)	37 (24.7%)	96 (64%)
p-value	>0.05		> 0.05	

As the duration of cultivation increases the health problems increases as well i.e eye problems and skin problems but it was not found to be statistically significant ($p > 0.05$).

Discussion

This study was conducted in Adargunchi and Noolviof Dharwad District of Karnataka with the aimed to assess the awareness of the safety practices related to pesticides among the farmers and to identify the health problems associated with it. In our study 93% of

the farmers were males 89% of them were cultivating for more than 10 years. Whereas in the similar study conducted by Strong et.al study 73.5 were male, 62.5 were cultivating for more than 10 years and in the Mohanty K M et.al study, all the participants were male (12,13).

In our study 68% were not aware of the harmful effects of pesticide and 7% were aware of the harmful health effects of pesticide treated product consumption. Whereas in the study conducted by Strong et.al, 91.9% were aware about the harmful effects of pesticides⁽¹²⁾.

In our study, 29.3% used masks, 7.3 used gloves, 2% used gloves, 1.3% used boots and resistant clothes and 0.7% used respirator pesticides application. In the study conducted by Strong et.al, 41.2% used protective boots, 38.4% gloves, 82% hat and 22.7% protective lenses always during the application of the pesticides. And in the study conducted by Mohanty K M et.al, 40% to 70% were not using any protective equipment during pesticide spraying^(12, 13).

46% of the respondents reported having general health problems such as headache, fatigue and malaise after exposure to pesticides. 35% reported eye problems such as burning, itching and watering. 28% reported skin problems such as itching, redness and 27% reported gastrointestinal symptoms such as loss of appetite, vomiting and diarrhoea. 2% reported of being hospitalized after exposure to pesticides. There were very few cases which manifested neurological symptoms and no reported cases of poisoning, respiratory, cardiac and renal problems. Only 5% of them have sought medical care.

Conclusion

93% were not aware of the harmful effects of pesticide. 78% did not undergo any practical training related to pesticides. 70% did not take any precautions nor use any protective equipment. 59% suffered from one or the other ailment due to exposure to pesticides and only 5% of them have sought medical care. Safety measures taken by farmers were not satisfactory and overall awareness of agricultural workers on pesticide was inadequate. The findings of the study emphasize the need to educate agricultural workers regarding safe and adequate use of pesticides to prevent health hazards.

Limitation

The study had some limitations. Firstly, the data was based on self report and evaluation was only based on questionnaire and didn't include any form of medical examination, therefore subject to bias. Secondly, the

farmers in Adargunchi and Noolvi grow mainly cotton, for which they use pesticides less frequently i.e., 1-2 times/year. So the results might not be generalizable.

Recommendation

Proper training in pesticide handling and education on the hazards of pesticide exposure would diminish substantially the health hazards currently facing by farmers. Continuous emphasis on the importance of protective equipment is essential for changing wrong habits of farmers which can be hazardous for their health. The farmers should be encouraged for periodic medical check-up to minimize the adverse health effects of the pesticides.

Acknowledgement: The authors would like to thank all the farmers in Adargunchi and Noolvi who had participated in the study for their co-operation and all the staff of Community Medicine Department KIMS, Hubli for extending their help in smooth conduct of this study.

Declaration

Funding: None

Conflict of Interest: None declared

Ethical approval: Not required

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Study of Proportion of HIV in Patients of Malignancy in Tertiary Care Cancer Hospital of Malwa Region of Punjab:A Hospital based Study

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Abstract

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. The purpose of this study is to obtain data on the prevalence of HIV in the cancer population and vice versa at a major tertiary cancer in Bathinda and as the HIV population is also growing, the proportion, epidemiology and demographic profile of HIV in cancer patients need to be evaluated. **Aims & Objectives:-** To estimate the proportion of HIV infection among cancer patients visiting tertiary care hospital in District Bathinda and to study the demographic profile of patients suffering from HIV and cancer as primary outcome and to study the epidemiology of cancer among HIV-infected people as secondary outcome. **Materials and Method:-** Descriptive cross sectional study in cancer patients coming to tertiary care cancer hospital in Bathinda. **Results & Conclusion:-** In our hospital based study, we observed low proportion of HIV (0.28%) as well as HIV+ Cancer patients(0.23%). In cancer patients burden of HIV-infection will have implications for current and future cancer risk.

Keywords: Malignancy. non-AIDS defining cancers, AIDS defining cancers.

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)⁽¹⁾ HIV affects the person's immune system and this state of immunosuppression with compromised immune system makes it harder for the body to fight infections. As the infection progresses, it further interferes with the immune system and reduces the body's ability to fight viral infections thus leading to ^(2,3,4) high risk of developing cancer as compared to uninfected people of the same age ^(5,6,7) in their lifetime. HIV allows cancer cells to spread faster than in someone without HIV. People with AIDS are 19 times more likely to be diagnosed with anal cancer, 3 times with liver cancer, 2 times likely to be diagnosed with lung cancer, 2 times as likely to be

diagnosed with oral cavity/pharynx cancer and about 8 times more likely to be diagnosed with Hodgkin lymphoma compared with the general population. Collectively all these malignancies are called "non-AIDS-defining cancers" ^(1,2). HIV infection increases the risk of cancer and also increases the mortality in cancer patients ^(8,9). The poor cancer survival rate of HIV-infected people may be due to weakened immune system, cancer being more advanced at diagnosis and also delay in cancer treatment. As cancer risk increases with age, people living with HIV/AIDS are at an increased risk of developing cancer. The aim of this study is to obtain data on the prevalence of HIV in the cancer population and vice versa at a major tertiary cancer in Bathinda and as the HIV population is also growing, the proportion, epidemiology and demographic profile of HIV in cancer patients need to be evaluated.

Aims and Objectives

1. To estimate the proportion of HIV infection among cancer patients visiting tertiary care hospital in District Bathinda.
2. To Study the demographic profile of patients suffering from HIV and cancer.
3. To study the epidemiology of cancer among HIV-infected people

Materials and Method

Study design : Descriptive cross sectional study

Study Population: Cancer patients coming to tertiary care cancer hospital in Bathinda.

Study Period: 3 years from 01.01.16 to 31.12.19.

Sample Size: All the patients who were confirmed Histo-Pathologically for Cancer

A. INCLUSION CRITERIA: Patients confirmed Histo-Pathologically for Cancer were tested for HIV and other marker

B. EXCLUSION CRITERIA: Patients who came to OPD but did not took intervention from our Hospital

This descriptive study was carried out in a teaching cancer hospital in Bathinda (Punjab), India. Demographic and geographical data of the HIV patients with cancer admitted to our hospital was collected for a period of 4 years from 01.01.16 to 31.12.19.

Data

Data from this study were obtained from the cancer patients who visited ACI, Bathinda for treatment. The status of HIV infection was determined by the ELISA. This checkup has become routine for any cancer patient visiting our Hospital. The proportion has been determined according to the number of patients who visited ACI, Bathinda. Social characteristics (age, gender, marital status, tobacco and alcohol consumption, education, and body mass index) were reviewed

Analysis: Analysis was done on Microsoft Excel.

Table 1: Showing year wise distribution of cancer patients examined for HIV

Year of Diagnosis	Total Number of Samples	HIV Positive	HIV Postive with Cancer
2016	140	0	0
2017	356	0	0
2018	734	1	1
2019	879	5	4
TOTAL	2109	6	5

Table 2: showing age wise distribution of HIV positive patients

Age	HIV Postive with Cancer
30-40YRS	0
41-50YRS	2
51-60YRS	2
60-70YRS	1
TOTAL	5

Table:3: Showing sex distribution of HIV positive patients

Sex	HIV Postive with Cancer
Male	1
Female	4
Total	5

Discussion

Our study is a hospital based study in which we observed 0.28% of HIV among the samples received and 5 cases(0.23%) had HIV+ Cancer as out of 2109 received. 6 were reported HIV positive and out of this 6 cases reported only 5 had HIV+ Cancer .In our based study, we observed low proportion of HIV (0.28%) as well as HIV+ Cancer(0.23%) in cancer patients. Studies in this regards showed a high Proportion (2.1%) of the HIV infection in patients with cancer in surgical oncology unit^(10,11). In a report from Maharashtra proportion of HIV was 1.2%⁽¹¹⁾. As cancer risk increases with age the burden of cancer people infected with HIV has shifted to higher age group. 5 cases which were reported, 4 were in the age group of 45-55 years and 1 was more than 60 years. With the introduction of antiretroviral therapy mortality among HIV-infected individuals has reduced and the projected life expectancy in these patients is almost similar to that observed in the general population^[12].

The female gender was more predominant out of HIV+ Cancer patients as out of 5 cases reported, 4 were female and 1 was male. Similar finding has already been reported by several authors^[13] All these females patients were from rural background and were uneducated. Most likely reason for delayed presentation is lack of awareness, improper health care facilities, faith in quacks & drug abuse.

In this study, non-AIDS defining cancers were more frequent than AIDS defining cancers. Breast cancer was the most common of non-AIDS defining cancers in our study as 3 females had carcinoma breast and 1 had carcinoma ovary. Studies done by other authors like Yanik et al⁽¹⁴⁾ in sub-Saharan Africa^[13] Uganda^[13] and South Africa^[15] also supported the same fact.

Earlier in developed countries the number of AIDS defining cancers KS and NHL were more but recently one US study, focused on people with AIDS, stated that the number of cases of KS and NHL has declined and non-AIDS-defining cancer increased over time⁽¹²⁾ and lung cancer is the most common of non-AIDS defining cancers^[16,17]. This estimated changes in the cancer burden was largely because of growth and aging of the HIV population due to antiretroviral therapy as supported by authors.

Conclusions

Even though Proportion of HIV+ Cancer (0.23%) is low in our study and universal screening of patients with newly diagnosed cancer for hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV is not routine in oncology practice. But surely the burden of HIV-infected cancer patients will have implications for current and future cancer risk and the total burden of cases. Long term studies with large number of population needs to be done to reach to any definite conclusion and to know the exact burden of HIV in cancer patients and also to determine whether HIV changes the risk factors.Public health interventions and creation of integrated oncology and infectious diseases working groups for clinical research should be encouraged as prevention will be an important tool against these problems.

Ethical Clearance: Taken from Ethical Committee of our Institute.

Source of Fundind: Self.

Conflict of Interest: Taken

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Effect of Two Connector Designs on the Fracture Resistance of All-Ceramic Core Materials for Fixed Dental Prostheses: An In-Vitro Study

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Abstract

Background: The aim of this study was to test the difference in fracture resistance of 3 ceramic core materials used for simulated 3-unit all-ceramic FPDs with 2 fabrication techniques (lost-wax/heat-pressing and CAD/CAM methods) and 2 connector designs (round and sharp).

Material and method: The present in vitro study was conducted in the Department of Prosthodontics and Crown & Bridge, Subharti Dental College & Hospital, Meerut, Uttar Pradesh. For the purpose of this study, 3 all ceramic core materials were selected viz. Yttrium-tetragonal zirconia polycrystals, Milled Lithium disilicate glass ceramic and Lost-wax/heat-pressed lithium disilicate glass ceramic. A total of 10 rectangular bars of dimensions 30 mm (L) x 5 mm (W) x 5 mm (H) from each material were manufactured. Of these 10 bars, 5 bars were fabricated with sharp notch connector and 5 bars were fabricated with round notch connector. The dimensions of all specimens were measured and verified individually by an electronic caliper with an accuracy of 0.05 mm. The radius of each connector was measured with a measuring tool.

Results: The failure load was more in Press-R in comparison to Press-S and the difference was found to be statistically significant. The FS was more in CAD-R in comparison to CAD-S and the difference was found to be statistically significant.

Conclusion: The round connector design in yttrium stabilized zirconia and heat pressed lithium disilicate both may be considered to be the all-ceramic core material of choice for FDP's as they have highest failure load and flexural strength.

Keywords: FPD, Flexural strength, Failure load

Introduction

Esthetically driven dental treatment, biocompatibility, and improved mechanical properties

have contributed to the use of all-ceramic materials, not only in single unit restorations, but also for fixed partial dentures (FPDs). Recent research on dental ceramics has focused on the development of microstructurally refined, tougher, and stronger ceramic materials to enhance service life. Because of their potential for accurate margins and minimal shrinkage, hot pressable ceramic materials have been introduced for the fabrication of anterior and posterior 3-unit fixed partial dentures (FPDs)^{1,2}.

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The shape of an FPD is not uniform. In particular, the connector area has a narrow constriction for biologic and esthetic reasons, and these sites in 3-unit FPDs represent stress concentrations relative to the average stress levels within other areas of the prosthesis. The stress distribution in a ceramic prosthesis can be affected by a change in contour of the prosthesis components; this effect may be more significant at locations with an abrupt change of contour. This stress-raising effect may be much more significant in a brittle material, such as a ceramic that contains many small flaws and cracks in a variety of sizes and orientations. These factors may be more critical in posterior FPDs, where connector height is usually limited by short clinical molar crowns and because higher loads are produced in posterior areas^{3,4}.

Framework design, especially connector geometry, affects the strength of all-ceramic materials. The shorter the connector occluso-gingivally, the higher the stress concentration. Smoother, less angled connectors showed lower stress levels. As the radius at the gingival embrasure increased from 0.25 to 0.9 mm, the mean failure load increased by 140%. The radius of curvature at the occlusal embrasure has only a minor effect on the fracture susceptibility of 3-unit FPDs. Evidence is lacking with respect to how connector design affects these new ceramic materials. It is also unclear how connector design and fabrication techniques affect the strength of this materials⁵.

The purpose of this study was to test the difference in fracture resistance of 3 ceramic core materials used for simulated 3-unit all-ceramic FPDs with 2 fabrication techniques (lost-wax/heat-pressing and CAD/CAM methods) and 2 connector designs (round and sharp).

Material and Method

The present in vitro study was conducted in the Department of Prosthodontics and Crown & Bridge, Subharti Dental College & Hospital, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh. For the purpose of this study, 3 all ceramic core materials were selected viz. Yttrium-tetragonal zirconia polycrystals (IPS e.max Zir CAD, Ivoclar Vivadent, Schaan, Liechtenstein), Milled Lithium disilicate glass ceramic (IPS e.max CAD, Ivoclar Vivadent, Schaan, Liechtenstein) and Lost-wax/heat-pressed lithium disilicate glass ceramic (IPS e.max Press,

Ivoclar Vivadent, Schaan, Liechtenstein). A total of 10 rectangular bars of dimensions 30 mm (L) x 5 mm (W) x 5 mm (H) from each material were manufactured. Of these 10 bars, 5 bars were fabricated with sharp notch connector and 5 bars were fabricated with round notch connector.

Preparation of master bar with different connectors:

Two master bars of dimension 30x5x5 mm were prepared by milling a ZirCAD block. On one of these bar a sharp notch (0.60±0.15-mm radius of curvature) were created. On the other bar a round notch (0.60±0.15-mm radius of curvature) was prepared manually, to define a central pontic of 10±0.10 mm in length. These master bars were again scanned to mill 10 specimen of each material.

Fabrication of zirconia specimens: Using the .stl file of scanned master bars, 5 samples having sharp connector notch and 5 samples having round notch were milled from pre sintered Yttrium-tetragonal zirconia polycrystals blocks. Anticipating a 20-25% postsinter shrinkage, the rectangular bars in this group were cut oversized from the block with a slow-speed saw (Hyperdent, Germany).

Fabrication of milled lithium disilicate specimens:

Using the .stl file of scanned master bars, 5 samples having sharp connector notch and 5 samples having round notch were milled from Lithium disilicate glass ceramic. As the crystallization process does not produce dimensional changes, all specimens were prepared from the ceramic blocks to the final desired size of 30 mm x 5 mm x 5 mm, in the same manner as for the ZirCAD group but in a wet milling machine (Roboice, Istanbul, Turkey). All 10 bars were crystallized following the manufacturer's instructions.

Fabrication of heat pressed lithium disilicate specimens:

Using .stl file of master bar of sharp connector notch and round connector notch 5 specimen of each connector design were milled on the inlay wax block. The milled specimens were heat pressed after lost wax technique under manufacturer's recommendation and a total 10 bars were prepared

The dimensions of all specimens were measured and verified individually by an electronic caliper (D & W, Istanbul, Turkey) with an accuracy of 0.05 mm. The radius of each connector was measured with a measuring

tool (Dial Caliper, Germany). A 3-point bending test was performed in a universal testing machine (Digital Tensile Testing Machine, Shambhu Nath & Sons, Uttam Nagar, New Delhi, India) with a loading speed of 0.1 mm/min until the maximum failure load was reached. The data were recorded and the failure load was registered in newton and flexural strength was recorded as newton per millimeter square (N/mm²).

Statistical Analysis

The data was analysed using SPSS software version 24. Anova test was used to compare the statistical difference between the groups.

Results

Zirconia, milled lithium disilicate, and heat pressed lithium disilicate specimens were further subdivided into sharp and round design. Thus the present study comprised of 6 groups ZirCAD-S, ZirCAD-R, CAD-S, CAD-R, Press-S and Press-R. The failure load was more in ZirCAD-R in comparison to ZirCAD-S and the difference was found to be statistically significant. CAD-S and CAD-R failure load ranged from 263 N-387 N (mean \pm SD 299 \pm 53.21 N) and from 285 N-455 N (mean \pm SD 392.2 \pm 71.01N) respectively. The failure load was more in CAD-R in comparison to CAD-S and the difference was found to be statistically significant. The failure load of Press-S and Press-R ranged from 289 N to 1157 N (mean \pm SD 707.2 \pm 385.19 N) and from 540 N to 1927 N (mean \pm SD 1090.8 \pm 514.29 N) respectively. The failure load was more in Press-R in comparison to Press-S and the difference was found to be statistically significant (Table 1,2).

The Flexural strength of ZirCAD-S and ZirCAD-R ranged from 243 N/mm² to 405 N/mm² (mean FS 242.2 \pm 79.19) and 162 N/mm² to 336 N/mm² (mean FS 337.4 \pm 67.25) respectively. The FS was more in ZirCAD-R in comparison to ZirCAD-S and the difference was found to be statistically significant. CAD-S and CAD-R FS ranged from 63 N/mm² to 100 N/mm² (mean FS 67.8 \pm 10.85) and 58 N/mm² to 85 N/mm² (mean FS 86.4 \pm 15.57) respectively. The FS was more in CAD-R in comparison to CAD-S and the difference was found to be statistically significant. The FS of Press-S and Press-R was ranged from 119 N/mm² to 426 N/mm² (FS 160.2 \pm 80.01 N/mm²) and 71 N/

mm² to 256 N/mm² and (mean FS 241 \pm 113.81 N/mm²) respectively. The FS was more in Press-R in comparison to Press-S and the difference was found to be statistically significant (Table 3,4).

Discussion

In the present study, 3 all ceramic core materials Yttrium stabilized zirconia, milled lithium disilicate, and heat pressed lithium disilicate were selected and a total of 30 rectangular bars were manufactured through CAD/CAM and heat press technique with 2 connector design sharp and round. When compared statistically, mean failure load of ZirCAD-S was significantly more than that of CAD-S. This can be explained as zirconia polycrystal materials exhibit mechanical properties superior to other machinable all-ceramic materials available. In a study done by Rodrigo Alessandri et al⁶ and Ricardo Fabian Fonzar et al⁷ they concluded that milled lithium disilicate possessed lower fracture resistance than zirconia based materials. Our study also suggests these results.

Mean failure load (MFL) of Press-S was more than CAD-S but the difference was not significant. Alec Willard and Tien-Min Gabriel Chu⁸ in 2018 suggested that the sharp connector design in milled lithium disilicate plays an important role in crack propagation, here in our study the same reason appears to be the reason for Press-S group to show marginally better results than CAD-S in terms of MFL.

Between ZirCAD-R and CAD-R mean failure load of ZirCAD-R was found to be higher which was statistically significant. With 550 Mpa the strength of lithium disilicate is much lower than the strength of zirconia which is 900 Mpa. When force is applied directly to the long axis of a ceramic FDP connector, compressive stresses develop on the occlusal aspect, while tensile stress develop on the gingival aspect; such stresses contribute to the propagation of microcracks located at the gingival surface, leading to fracture. Michaela Pantea et al⁹ have suggested that Increasing the dimensions of the connector may decrease this effect.

When mean failure load of ZirCAD-S and ZirCAD-R was compared, ZirCAD-R possessed higher failure load. According to study by Hamza et al¹⁰, strength of the yttrium stabilised zirconia -based ceramics is affected

by the connector dimension and design. In accordance with this study, our result also affirms the fact that round connector design may withstand forces better than the sharp design.

When mean failure load of CAD-S and CAD-R was compared, the difference was statistically significant which can be explained by the fact that round connector design in CAD exhibits 77% higher fracture resistance than their corresponding sharp connector groups. The same however was not found with press group suggesting the fact that connector design affect only milled all ceramic in our case yttria stabilised zirconia and milled lithium disilicate not heat pressed lithium disilicate. This finding is however contrary to the study done by Fleming et al¹¹ where milled and heat pressed lithium disilicate were compared.

Our study suggests that round connector design of zirconia bridge has better mechanical properties studied, when compared to all other study materials. However when esthetics is of utmost concern, pressable ceramics with round connector should be preferred.

Conclusion

It can be concluded from the present study that structural reliability and strength of industrially prepared ceramic blocks are negatively affected by the milling procedure. The sharper the milling bur configuration used, the greater the potential for defects and flaws induced in the ceramic. This lessens the ability of these materials to withstand catastrophic forces. The round connector design in yttrium stabilized zirconia and heat pressed lithium disilicate both may be considered to be the all-ceramic core material of choice for FDP's as they have highest failure load and flexural strength.

Ethical Clearance: Subharti Medical College, Meerut

Source of Funding: Self

Conflict of Interest: Nil

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Table 1: Mean failure load (N) among the sharp and round connector groups

Group	Mean	SD	Minimum	Maximum
ZirCAD-S	1097.8	358.50	736.00	1522.00
CAD-S	299	53.21	263.00	387.00
Press-S	707.2	385.199	289.00	1157.00
Anova test	8.55			
p value	0.01*			
ZirCAD-R	1528	303.54	1102.00	1832.00
CAD-R	392.2	71.01	285.00	455.00
Press-R	1090.8	514.29	540.00	1927.00
Anova test	13.61			
p value	0.001*			

*: statistically significant

Table 2: Mean failure load (N) among the different groups

Groups	Mean	SD	Subgroup	Mean	SD	Minimum	Maximum
ZirCAD	1312.9	386.63	ZirCAD-S	1097.8	358.50	736.00	1522.00
			ZirCAD-R	1528	303.54	1102.00	1832.00
t test			2.69				
p value			0.04*				
CAD	345.6	76.89	CAD-S	299	53.21	263.00	387.00
			CAD-R	392.2	71.01	285.00	455.00
t test			2.35				
p value			0.04*				
Press	899	473.68	Press-S	707.2	385.199	289.00	1157.00
			Press-R	1090.8	514.29	540.00	1927.00
t test			1.33				
p value			0.22				

*: statistically significant

Table 3: Mean FS (N/mm²) among the sharp and round connector groups

Group	Mean	SD	Minimum	Maximum
ZirCAD-S	242.2	79.19	162.00	336.00
CAD-S	67.8	10.85	58.00	85.00
Press-S	160.2	80.01	71.00	256.00
Anova test	8.93			
p value	0.004*			
ZirCAD-R	337.4	67.25	243.00	405.00
CAD-R	86.4	15.57	63.00	100.00
Press-R	241	113.81	119.00	426.00
Anova test	13.57			
p value	0.001*			

*: statistically significant

Table 4: Mean FS (N/mm²) among the different groups

Groups	Mean	SD	Subgroup	Mean	SD	Minimum	Maximum
ZirCAD	289.8	85.53	ZirCAD-S	242.2	79.19	162.00	336.00
			ZirCAD-R	337.4	67.25	243.00	405.00
t test			2.57				
p value			0.04*				
CAD	77.1	16.01	CAD-S	67.8	10.85	58.00	85.00
			CAD-R	86.4	15.57	63.00	100.00
t test			2.42				
p value			0.04*				
Press	200.6	102.05	Press-S	160.2	80.01	71.00	256.00
			Press-R	241	113.81	119.00	426.00
t test			1.29				
p value			0.23				

*: statistically significant

Clinical Significance Versus Statistical Significance with Regards Gingival Scores in Herbal and Chlorhexidine Mouthwash Clinical Trials- A Systematic Review

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Abstract

Purpose: Does clinical significance match with the statistical significance with respect to gingival score when herbal mouthwash is used in comparison to the chlorhexidine mouthwash?

Material and Method: A systematic search of literature was conducted on two databases (PubMed and Google Scholar) for the studies published from 1st January 2006 to 31st December 2018. Cross-references were checked. Hand searching was done in the library. Studies were included if they were done among healthy, non hospitalized humans and compared chlorhexidine with herbal mouthwash for the gingivitis score. Clinical significance was ascertained based on Loe and Sillness (1967) Gingival index interpretation.

Results: A total of 22 unique clinical trials were identified and 24 estimates which used Gingival index as outcome assessor. 18 estimates showed matching between clinical significance and statistical significance in the chlorhexidine group while in herbal group it was found only in 15 estimates. As per Thirthalli J, Rajkumar RP criteria none of the studies showed clinical significance.

Conclusion: Statistical significance does not always mean clinical significance. Researchers should modify their study design to focus on clinical significance along with statistical significance.

Keywords: *Clinical significance, statistical significance, herbal mouthwash, chlorhexidine .*

Introduction

Gingivitis is a worldwide phenomenon reaching to high epidemic proportions.¹ Microbial plaque plays an important role in development of gingivitis.² It can be controlled by using mechanical plaque control measures like toothbrush, dental floss, interdental brush etc. In addition, chemical control such as mouthwashes can also be used. Mouthwashes have the ability to reach those areas where mechanical plaque control cannot reach. Many agents such as bis-biguanides,

essential oils, quaternary ammonium compounds, antibiotics and antiseptics have been used as mouth washes. Chlorhexidine (bis-biguanide) is well known and well studied chemical agent to control gingivitis. It is commonly used in two concentrations 0.2% and 0.12%, which can be with or without alcohol, and literature shows that there is no difference in their efficacy with regards the two different concentrations.³ There are some side effects such as staining of teeth and loss of taste sensation which restricts its use for long duration. To overcome this side effect many other alternative mouthwashes are being researched for. Herbal products have been used since ancient times, and in last 2 decades it has become mainstream for research because of its natural ingredients and less expensive prescriptions.⁴ Herbal mouthwashes available over the counter indicates they are in demand by the people.

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In a clinical trial, when two interventions are compared and statistical significance is obtained for the outcome variable, the null hypothesis is rejected and thus it is concluded that one treatment procedure is better than the other.¹ However, a statistically significant reduction in symptom ratings may or may not represent a clinically meaningful treatment response or the magnitude of the difference.^{5,6} The p value of <0.05 tells us that there is difference between the groups but does not necessarily tell us how much clinically significant difference.

Statistical significant deals with the numbers, while according to LeFort, results will be called clinically significant if the newer modality is better enough to make a real difference in the people's life, effect of the treatment will last for a longer time, it is cost effective and it is easy to implement.⁷

The aim of this study was to compile all the clinical studies conducted, comparing herbal mouthwash against Chlorhexidine and to evaluate if statistical significance matches with the clinical significance with regards gingival scores.

One of the reasons to undertake this study was that the authors, researchers and readers should be able to appreciate the difference between statistically significant clinically relevant data and statistically significant clinically insignificant data.

Material and Method

Literature Search :

The electronic search was initially conducted on the MEDLINE via PUBMED database with the following search strategy "Gingivitis (tw)* AND Chlorhexidine (tw)* AND herbal (tw)* AND mouthwash (tw)*", "Gingival inflammation (tw)* AND chlorhexidine (tw)* AND natural product (tw)* AND mouthrinse (tw)*", "Gingival inflammation* OR gingivitis* AND chlorhexidine* AND natural product* OR herbal* AND mouthrinse* OR mouthwash*. In addition, Google Scholar was also searched. We also manually searched the reference lists of eligible studies to ensure identification of relevant published and unpublished studies. We also contacted study authors to provide full text articles. Search was conducted for the article during the period of January 1st 2006 to December 31st 2018

Eligibility criteria: All the studies reporting randomized control trials for herbal and chlorhexidine mouthwashes used for anti-gingivitis regimen; studies conducted in humans; studies considering Loe and Sillness (1967) gingival index as an outcome assessor and papers written in English language only and where there is a possibility to translate the foreign language to English. Case reports, Letter to the editor abstracts and narrative reviews were excluded.

Two reviewers (DD and PK) independently performed the first stage of screening by titles of all the identified studies. Round 2 included screening by the abstracts. Round 3 was full text assessment.

Data extraction

A standardized, pre-piloted form was used to extract data from the included studies for evidence synthesis. One review author (DD) extracted data independently and second author (PK) cross checked the data. Discrepancy if any, was identified and resolved through discussion with a third author (SHS) where necessary. The extracted data included the following: Study ID, author name, year of publication, sample size, intervention group, comparison group, duration of the trial, index used, mean and standard deviation of the gingival baseline and end of trial scores, statistical significance as reported in the article and the clinical significance (calculated by the reviewers).

Clinical significance calculation:

It was ascertained based on Gingival index score interpretation⁸. The interpretation score mentioned is as follows: 0.0- No gingivitis ; 0.1-1.0 – Mild gingivitis ; 1.1 – 2.0 Moderate gingivitis ; 2.1 – 3.0 Severe gingivitis.

At the end of the trial, in both the study and control group, if the baseline score moved up from higher interpretation grade to lower, it was considered as clinically significant. For e.g. before intervention the base line score was 1.3 (moderate gingivitis) and post intervention the end score was 0.9 (mild gingivitis) , than this intra group comparison was considered as clinically significant. But if the baseline score and the end score remained in the same interpretation grade, it was not termed as clinically significant.

Thirhalli J and RajkumarRP⁹ proposed five criteria which were used to assess the clinical significance of the studies. The criteria were as follows: 1. What are the implications of the adverse effects profiles? 2. Are the outcome measures appropriate? 3. Are the effects of a treatment sustained? 4. Is the treatment cost effective? 5. Do the findings generalize to different context?

Results

A total of 22 articles unique clinical trials and 24 estimates were identified (Prisma Flow chart depicted as Fig 1).

The characteristics of experimental and control group mouthwashes are depicted in Table 1. There was a wide variation noted in the duration of the study period (Table 1). Four studies (XIX-XXII), were conducted for 30 days, four studies (XV-XVIII) were conducted for 4 weeks, eight studies (VII-XIV) were conducted for 21 days, two studies (V,VII) for 15 days, two studies were conducted for 14 days (III, IV), one study (II) was conducted for 7 days and one study (I) was conducted for 5 days.

Intra group comparison remarks (Table 1): The mean gingival score at baseline and end of trial in both experimental and control group were correctly reported in all the studies. In the herbal mouthwash group, there were seven studies which were statistically significant clinically not significant (I,IV-VIII,XIX), whereas 15 studies were clinical and statistically significant (II,III,IX-XVIII, XX-XXII). In the Chlorhexidine mouthwash group: six were statistically significant but not clinically significant (I,IV-VII,XIX) and 18 studies showed a clinical and statistical significance (II,III,VIII-

XXII).

Table 2 showed results of clinical significance as assessed by Thirhalli J and Rajkumar RP⁹ criteria. The studies considered in this review, reported adverse effects in four studies (II, XVI,XXII) with both chlorhexidine and herbal mouthwash. All the studies reported the outcome measurements and statistical significance. None of the studies carried out any follow up after the study was completed and also none of the studies mentioned the cost of the mouthwash in their paper and hence it cannot be commented whether the treatment was cost effective or not. The findings cannot be generalized to different context in any study. Overall, none of the study showed clinical significance.

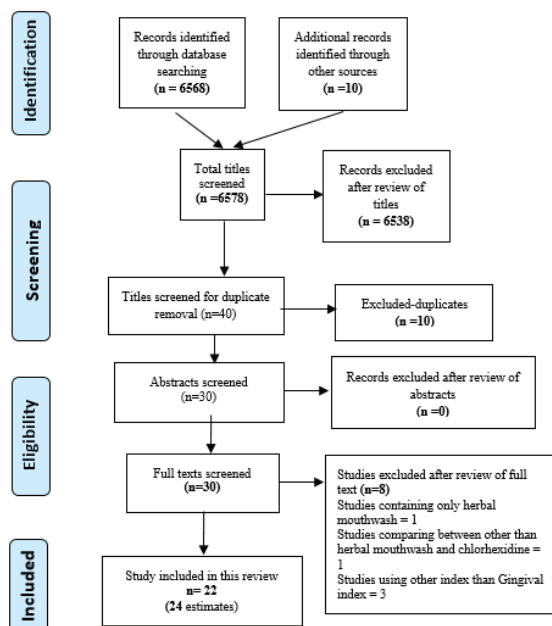


Fig 1: PRISMA flow-chart

Table 1: Data extraction sheet.

Study id	Intervention	Comparison	Duration of trial	Herbal baseline	CHX baseline	Herbal End score	CHX End score	Herbal		CHX	
				Mean	Mean	Mean	Mean	Statistical significance	Clinical significance	Statistical significance	Clinical significance
I	Hiora mouthwash	0.2% CHX	5 days	0.57	0.56	0.83	0.77	S	NS	S	NS
II	1% Lippia sidoides	0.12% CHX	7 days	1.57	1.63	0.7	0.6	S	S	S	S
IIIa	2% Neem	0.2% CHX	14 days	2.5	2.67	1.11	1.22	S	S	S	S
IIIb	0.5% Green tea	0.2% CHX	14 days	2.44	2.67	1.11	1.22	S	S	S	S
IV	Hiora mouthwash	0.2% CHX	14 days	0.15	0.19	0.03	0.04	S	NS	S	NS
V	M. Koenigii	0.2% CHX	15 days	1.94	1.92	1.24	1.27	S	NS	S	NS
VIa	2% Neem	0.2% CHX	15 days	0.49	0.48	0.34	0.22	S	NS	S	NS
VIb	2% Neem	0.2% CHX	15 days	0.55	0.61	0.36	0.39	S	NS	S	NS
VII	0.19% A. Indica	0.2% CHX	21 days	1.7	1.9	1.2	1.1	S	NS	S	NS
VIII	Hiora mouthwash	0.12% CHX	21 days	1.9	1.92	1.1	0.15	S	NS	S	S
IX	0.25% lemongrass oil	0.2% CHX	21 days	2.19	2.23	1.59	1.67	S	S	S	S
X	Triphala and Ela decoction	0.2% CHX	21 days	1.78	1.89	0.53	1.29	S	S	S	S
XI	Arimedadi oil	0.2% CHX	21 days	1.81	1.82	0.66	0.66	S	S	S	S
XII	0.1% turmeric	CHX	21 days	1.7	1.8	0.66	0.7	S	S	S	S
XIII	Turmeric	CHX	21 days	1.81	1.77	0.71	0.73	S	S	S	S
XIV	0.6% Triphala	0.12% CHX	21 days	1.24	1.23	0.9	0.94	S	S	S	S
XV	Herboral mouthwash	0.2% CHX	4 weeks	1.96	2	0.6	0.28	S	S	S	S
XVI	4% Ocimum sanctum	0.12% CHX	4 weeks	2.23	2.36	1.35	1.44	S	S	S	S
XVII	Sedifent	0.2% CHX	4 weeks	1.18	1.15	1.02	0.87	S	S	S	S
XVIII	Green tea	CHX	4 weeks	2.01	2.06	1.23	1.2	S	S	S	S
XIX	Aloe vera	0.12% CHX	30 days	1.99	1.97	1.15	1.11	S	NS	S	NS
XX	Cinnamon	CHX	30 days	2.7	2.9	1.1	0.7	S	S	S	S
XXI	Aloe vera	CHX	30 days	2.23	2.36	1.35	1.44	S	S	S	S
XXII	Herbal	CHX	30 days	3.6	3.2	2.01	1.6	S	S	S	S

Table 2: Thirthalli Jand Rajkumar RP criteria for clinical significance

Study Id	What are the implications of the adverse effects profiles?	Are the outcome measures appropriate?	Are the effects of a treatment sustained?	Is the treatment cost effective?	Do the findings generalize to different context?	Overall interpretation (Clinical significance)
I	●	●	●	●	●	NS
II	●	●	●	●	●	NS
III	●	●	●	●	●	NS
IV	●	●	●	●	●	NS
V	●	●	●	●	●	NS
VI	●	●	●	●	●	NS
VII	●	●	●	●	●	NS
VIII	●	●	●	●	●	NS
IX	●	●	●	●	●	NS
X	●	●	●	●	●	NS
XI	●	●	●	●	●	NS
XII	●	●	●	●	●	NS
XIII	●	●	●	●	●	NS
XIV	●	●	●	●	●	NS
XV	●	●	●	●	●	NS
XVI	●	●	●	●	●	NS
XVII	●	●	●	●	●	NS
XVIII	●	●	●	●	●	NS
XIX	●	●	●	●	●	NS
XX	●	●	●	●	●	NS
XXI	●	●	●	●	●	NS
XXII	●	●	●	●	●	NS

● mentioned ● not mentioned NS-Not significant

Discussion

The aim of this review was to provide a comprehensive appraisal and differentiate between the statistical significance and clinical significance of the gingival score parameter in the clinical studies conducted using chlorhexidine and herbal mouthwashes among human participants. The results of this review showed that it is possible to have statistical significance without having clinical relevance. As per Thirthalli J and Rajkumar RP⁹ criteria all the studies considered in the review showed that there was statistical significance but were clinically insignificant. This review, concludes that the clinical trials have not been designed keeping in mind the clinical significance but it is oriented towards finding out the statistical significance only between the two groups to report which treatment is better than the other.

One of the reasons why statistical significance may be more popular among the researchers, authors and readers is because p value cut-off ($p < 0.05$) gives a simple YES/NO answer to differentiate between two groups, unlike the clinically significant result which needs calculation on multiple factors.

Greenstein G³¹ in his paper discusses that statistical significance testing as a method to infer that results of periodontal clinical trials are clinically meaningful, have shortcomings. He suggests that, what determines clinically significant results should be defined before initiating a study and statistical significance testing should be used to validate that findings did not occur by chance.

This paper recommends that the researchers clearly define parameters for clinical significance testing while designing the study and incorporate following important criteria's: Adverse effects, appropriate outcome measure, post intervention follow up, cost effectiveness and generalizability.

This review has few limitations. While calculating the clinical significance, only Gingival index was taken, hence we had to exclude other studies which have used other indices. Only those indices with interpretation remarks can be chosen.

Conclusion

Based on the factors used for assessing clinical significance, the present review concludes that statistical significance does not always match clinical significance. Researchers should modify their study design to focus on clinical significance along with statistical significance.

Ethical Clearance: Not required.

Source of Funding: NA.

Conflict of Interest: Nil

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Impact of Two Grip Strengthening Exercise Protocols on Grip Strength of Non-Dominant Hand

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Abstract

Introduction: Power grip is commonly used as an index to assess impairment and treatment outcomes of hand. There is very less literature available on effect of strengthening exercises on non dominant hand in normal individuals. This study is planned with a vision to get an exercise protocol which can improve the hand grip strength of non dominant hand significantly in both genders.

Methodology: Study sample was extracted from all the students of Subharti College of physiotherapy. 30 male subjects and 30 female subjects between 18-25 years were selected randomly. These individuals were then distributed randomly in two groups keeping in mind the equal distribution of males and females in both the groups. Group A(control) was allocated for squeezing exercises alone for 6 weeks with periodicity of exercising 3 times a week. Group B(experiment) was advised the combination squeezing and hand gripper exercises for 6 weeks with periodicity of exercising 3 times a week.

Results: Increase in the mean grip strength of experimental group was statistically significant while of control group it was not. Increase in mean grip strength of males was statistically significant in experimental group while it was significant in control group while in females mean grip strength increased significantly in both experimental and control groups.

Conclusion: Combination of grip and squeezing exercises have a better impact on mean grip strength than squeezing exercise alone in non dominant hand in normal person. Findings can be used in sports like cricket, lawn tennis etc, where grip of nondominant hand is also important.

Key Words- Grip exercise, non dominant hand, squeezing exercise, gripping exercise

Introduction

The human hand has been characterized as a symbol of power, as an extension of intellect, as the seat of the

will. The hand and the wrist are the most active and intricate parts of the upper extremity because of this they are vulnerable to injury, which can lead to functional difficulties, and they do not respond well to serious trauma^[1]. Many daily activities involve interaction with objects that are grasped in the hand. The manipulative ability of human hand requires effective force and dexterity^[2]. Hand functionality is considered to be vital in most of the daily activities involving upper limb be it carrying loads, lifting objects, opening or closing doors to name a few. Most sports activities also require adequate grip strength to enhance performance and

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prevent injuries. For routine daily activities of hand high activity of flexor musculature of forearm and hand is required^[3]. Power grip is a forceful act resulting in flexion of all finger joints. When thumb is used, it act as a stabilizer to the object held between the fingers and the palm. Power grip is commonly used as an index to assess impairment and treatment outcomes of hand function^[4]. Analysis of grip strength is an important index of hand rehabilitation program as because it assess the patient's initial limitation and can be compared with normal. Measurement of hand grip strength utility continues throughout the treatment process because it provides a quick reassessment^[5]. Hand grip strength is widely considered as an objective index of functionality of upper extremity which can be optimized with a reliable evaluation^[6,7]. It has been proved earlier that the population as a whole demonstrated significant differences between the dominant and non-dominant handgrip strength^[8]. Therapist often follows the 10% rule as general guidelines. This rule states that person's grip strength in dominant hand is 10% greater than that of non-dominant hand ^[9]. There is very less literature available on effect of strengthening exercises on non dominant hand in normal individuals. This study is planned with a vision to get an exercise protocol which can improve the hand grip strength of non dominant hand significantly in both genders. Non dominant hand strengthening is a very important part of rehabilitation process, because If, the injuries involving dominant hand loss also. The objective of study was to evaluate the effectiveness of squeezing exercise and combination of squeezing and hand gripper exercises for grip strengthening of non dominant hand in 18-25 years old students of both genders.

Methodology

Study sample was extracted from all the students of Subharti College of physiotherapy. 30 male subjects and 30 female subjects between 18-25 years were selected randomly.

Inclusion criteria includes Normal healthy individuals, Age group 18-25 years, Both males and females, Right hand dominant persons, not having any history of traumatic injury to non- dominant hand (left) since last 1 year, Not having any neurological deficit in Non- Dominant Hand. **Exclusion criteria includes** Age

below 18 years and above 25 years, Left hand dominant person, Unhealthy individuals, Having any history of traumatic injury to Non-dominant hand since last one year, Neurological deficit in non dominant hand. This device is the most widely reported and recommended measure of grip strength.



Photograph 1. Showing equipments used in study

These individuals were then distributed randomly in two groups keeping in mind the equal distribution of males and females in both the groups. Group A with 30 subjects was control group and Group B also having 30 subjects constituted experimental group.

Group A was allocated for squeezing exercises alone for 6 weeks with periodicity of exercising 3 times a week.

Group B was advised the combination squeezing and hand gripper exercises for 6 weeks with periodicity of exercising 3 times a week. Subjects were asked to sit on the chair with straight back, without armrest with the feet flat on the floor, shoulder adducted and neutrally rotated, elbow flexed at 90°, forearm in neutral position and wrist between 0° – 30° of extension and between 0°- 15° of ulnar deviation (As given by ASHT)^[10-13]. Then the handle of dynamometer was set at setting 3.8 cm apart^[14] and kept constant for all. Subjects were asked to hold the dynamometer in above said position and were instructed to squeeze to initiate the optimal handgrip strength. All the subjects were evaluated in same position and under the same protocol. Every subject was demonstrated and then was asked to initiate handgrip strength using dynamometer.

Exercise Protocol

1) General squeezing exercises with squeezing ball.

- a) Holding time-10 seconds.
 - b) Resting time-2 seconds
 - c) No. of repetition-10 times
 - d) Total duration-2 minutes
 - e) No of sitting-3 times a week for 6 weeks
- 2) Hand gripper exercises (20 kg weight)
- a) Holding time-2 seconds
 - b) Resting time-1 seconds
 - c) No. of repetition-10 times
 - d) Total duration- 30 second

- e) No of sitting-3 times a week for 6 weeks

All the analysis was obtained using SPSS 19. A base line data was taken at the beginning of the study (pre test values) and after the completion of the intervention (post test values) to analyze the difference between the two groups and group themselves, Mann-Whitney U-statistic was used. A level of 0.05 was used to determine the statistical significance.

Results

When the experimental and control groups were compared pre and post intervention, it was found that the increase in the mean grip strength of experimental group was statistically significant while of control group it was not (Table 1).

Table 1- Pre and post intervention comparison (total)

Parameter	Experimental group		Control group	
	Pre intervention	Post intervention	Pre intervention	Post intervention
Mean grip strength	20.15	25.40	21.150	23.400
Standard deviation	3.15	4.29	3.787	4.122
Standard error	.70	0.96	0.8469	0.9217
	Mann-Whitney U-statistic = 66.000 The two-tailed P value is 0.0003		Mann-Whitney U-statistic = 134.00 The two-tailed P value is 0.0762	

When the comparison was done among females of experimental and control group,pre and post intervention , it was found that increase in mean grip strength was statistically significant in both categories but experimental group had more significant difference than control group (Table 2).

Table 2. Pre and post intervention in females of experimental and control group.

Parameter	Experimental group		Control group	
	Pre intervention	Post intervention	Pre intervention	Post intervention
Mean grip strength	17.7	22.3	18.4	20.5
Standard deviation	1.2	1.7	1.8	1.5
Standard error	0.36	0.53	0.58	0.47
	Mann-Whitney U-statistic = 1.5 The two-tailed P value is 0.0003		Mann-Whitney U-statistic = 21.0 The two-tailed P value is 0.03	

When the comparison was done among males of experimental and control group, pre and post intervention, it was found that increase in mean grip strength was statistically significant in experimental group while it was significant in control group (Table 3).

Table-3. Pre and post intervention in males of experimental and control group.

Parameter	Experimental group		Control group	
	Pre intervention	Post intervention	Pre intervention	Post intervention
Mean grip strength	22.6	28.5	23.9	26.3
Standard deviation	2.5	3.8	3.18	3.8
Standard error	0.79	1.2	1.0	1.2
	Mann-Whitney U-statistic = 9.5 The two-tailed P value is 0.003		Mann-Whitney U-statistic = 1.5 The two-tailed P value is 0.17	

Discussion

Present study was aimed to compare the effect produced by squeezing exercises alone and combination of squeezing and grip strengthening exercises on non dominant hand.

Results of the study revealed that the increase in the strength after combination of exercises was significantly higher while the effect produced by squeezing exercise alone was not statistically significant. In control group only females had significantly increased mean grip strength after completion of protocol, in squeezing exercises, while males did not. The difference might be due to the fact that normal males in routine life bears this minimal amount of resistance in activity of daily living as driving bikes, playing cricket etc.

Hence the outcome expected from such exercise would not be significant, on the other hand females don't encounter such tasks daily, so even, this soft exercise was able to produce significant difference. This difference was also discussed by Vincent Wai-Shing Lau et al^[15] when they stated that It is recommended that when assessing the progress and outcome of hand rehabilitation, the occupation and demand level of hand use of the patient must be taken into consideration when using the uninjured hand for comparison. This fact was

also proved in different way by Paddy Jarit^[16] where they found that in young basketball players there was no significant difference in strength of dominant and non dominant hand since both the hands were used equally for same amount of resistance. Like the results of present study Mika Matsumura et al^[17], Matthew W. Rogerset et al^[18] & Hartwig Woldag et al^[19] also find the significant rise in grip strength after gripping exercises. Present study found that the males has higher grip strength than females which matches with the findings of Shu-Wen Wu et al^[20], R.E. Anakweet al^[21] & Esther Luna-Heredia et al^[22] who found that gender difference is present for grip strength and males had higher grip strength than females. Grip exercises are absolute necessity to improve the grip strength and limb exercises are not a substitute for grip strengthening this was also proves when Birgitta Langhammer et al^[23], Sandstedt et al^[24] and Suleyman Patlar^[25] did not notice any improvement in grip strength after routine limb exercises.

Acknowledgement-

Conflict of Interest- No

Conclusion

Combination of grip and squeezing exercises have a better impact on mean grip strength than squeezing

exercise alone in non dominant hand in normal person. Findings can be used in sports like cricket, lawn tennis etc , where grip of nondominant hand is also important.

Ethical Clearance- Taken from Institutional Ethical Committee

Source of Funding- Self

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Mental Distress among Students of a Private University of Delhi, NCR

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Abstract

Background: One of the emerging significant public health problems is mental distress which includes somatic symptoms such as anxiety and depression. In comparison to the general population, earlier studies reported higher mental distress among university students. Students having mental distress suffer from poor academic performance and other learning disabilities. Due to the dearth of literature on the burden of this problem in India, the present study was done to assess the prevalence of mental distress and its association with sociodemographic, personal and academic related variables among students of a private university of Delhi, NCR.

Methods & Materials: A cross-sectional observational study was done on 300 private university students of Delhi, NCR. We applied the Self Reporting Questionnaire (SRQ-20) for the assessment of mental distress. Descriptive and Chi-square statistics were done. p value <0.05 was considered statistically significant.

Result: The study participants were predominantly females 58.7%. It was also observed that 13% participants were unsatisfied with admission in the college, 17.3% were unsatisfied with their academic course and 16.3% were unsatisfied regarding coping up with course.

On bivariate analysis it was observed that level of course ($p<0.001$), history of parental conflict (<0.001), satisfaction with life (<0.001) showed higher statistically significant association with mental distress. Similarly, academic variables such as satisfaction with admission to college ($p<0.001$), satisfaction with academic course (<0.001), satisfaction with coping up with course (0.003) were also highly statistically significant.

Conclusion: It is noted that mental distress is common among university students and there is a need for attention, support and personalized counseling.

Keywords: *Mental distress, SRQ-20, university students.*

Introduction

Mental distress is defined as disturbance and unpleasant mental-emotional state such as fear, anxiety, depression, confusion and mood swings often impairing the ability to cope with day to day ability⁽¹⁾. Mental distress is becoming a common problem among university students accounting for nearly 12% of the global burden of disease⁽²⁾. By 2020, mental distress is

expected to become the second most important cause of disability in the world⁽²⁾. In recent years, due to strong competition and aspiration, this makes the students more vulnerable to developing mental distress. Hence the study was undertaken to find the prevalence of mental distress and its association with socio-demographic, personal and academic-related variables among students of a private university of Delhi, NCR.

Materials and Method

A cross-sectional study was conducted among 300 students of a private university of Delhi NCR. The study was conducted during mid-semester to ensure that no university examination or event might add extra pressure on students.

A self-constructed, pre-tested questionnaire was used to collect information on socio-demographic, personal and academic-related variables. Mental Distress was assessed using SRQ-20. It is an instrument having 20 questions for the respondents regarding the symptoms and difficulties faced which are significantly seen in the condition of neurotic disorder⁽³⁾ The questions are oriented concerning certain symptoms and problems that might cause difficulties to the participants in the last 30 days. Answers are based on yes & no which are scored as 1 & 0, 1 for yes that indicate symptoms were present during the past month and 0 for no indicates the symptoms were absent.

The maximum score is 20 and anyone with cutoff score ≥ 10 suffers from mental distress. It has been used in different countries and is available in many international languages as well⁽³⁾. Informed consent was taken from the study participants. Institutional ethical approval has been taken.

Inclusion criteria: Students who gave their informed consent to participate in the study.

Exclusion criteria: Those students diagnosed with any form of mental illness and currently on medication.

Data was analyzed using SPSS Version 23.0 (SPSS Inc., Chicago, IL, USA).

Result

Majority(48%) of study participants were between 16-20 years of age. 58.7% study participants were females. 90.7% of the participants belonged to general category. Out of 300 study participants, alcohol and smoking was reported in 27.3% and 27% of students respectively. With respect to academic related variables, 70.3% of the participants were satisfied with admission in college.

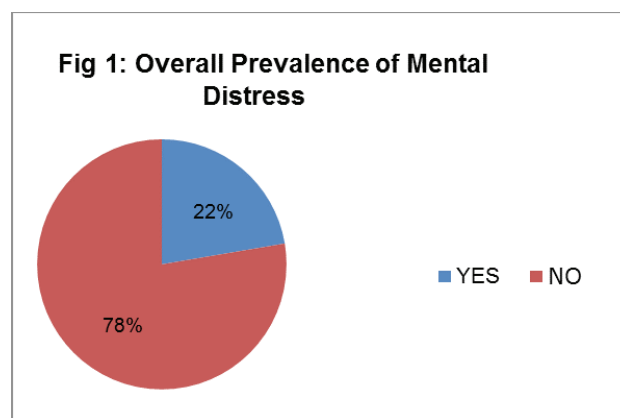


Figure 1 shows that out of a total of 300 students of a private university the overall prevalence of mental distress was 22%. Age, level of course, history of parental conflict, current mental status, satisfaction with life, satisfaction with academic course and fear regarding future life were the contributing factors regarding mental distress among student.

Bivariate analysis was applied to study the association between sociodemographic, personal and academic related variables with mental distress.

Table 3 shows that on applying bivariate analysis students, study participants between age 16-20years showed higher proportion of mental distress (n=47,32.6%) compared to students >20years (n=14, 10.3%) and this association was highly statistically significant. (p<0.001)

On studying the association between academic variables and mental distress, students who were unsatisfied with admission to college had higher mental distress (n=21,42%) than those who were satisfied with admission to college (n=41,18.8%) and this association was highly statistically significant. (p<0.001). (Table 3)

Discussion

Our study was conducted in the mid-semester, to ensure that the students were not under the influence of any college event or examination on joining the university, Our observations suggested that 22.3% of the university students sampled in this study were under distress.

A study carried out in different regions of India reflect diverse situations depending on the use of study instruments. Similar findings were observed in the Kolkata study, where the prevalence of mental distress

was found to be 14.5% among medical students⁽²⁾. A study done among medical under-graduate students in Bhubaneswar (Odisha) reported the prevalence of depression, anxiety and stress using DASS (Depression Anxiety Stress Scale) scale as 51.3%, 66.9%, and 53% respectively⁽¹¹⁾. A study in Jodhpur found that 57.98% of Medical students were depressed whilst 47.41% of the students suffered from anxiety⁽¹²⁾. A Delhi based study carried out using the Patient Health Questionnaire (PHQ-9) reported the prevalence of depressive and major depressive disorder to be 21.5% and 7.6% respectively⁽¹³⁾.

Similar findings have been reported from else where in the world as well. A study from Ethiopia reported the prevalence of mental distress using SRQ-20 (Self-Reporting Questionnaire) among university students to be 21.6%, (South-West Region) Studies from different North West Region from Ethiopia showed prevalence of mental distress as 40.09% and 11.7% (Addis Ababa, Ethiopia)⁽⁴⁾⁽⁶⁾⁽⁷⁾. A study from Ireland using GHQ (General Health Questionnaire) and LBQ (Lifestyle Behaviour Questionnaire) reported 41.9% of university student respondents being mentally distressed⁽⁸⁾. Another study from the University of Iceland using Symptoms Checklist – 90 Depression and Anxiety Subscale among female students showed 22.5% and 22.2% of depression and anxiety respectively⁽⁹⁾. A study from five faculties at Jazan University, Saudi Arabia found that 31% of undergraduate students were psychologically distressed based on the BSI-18 scale (Brief Symptom Inventory-18)¹⁰⁾.

The predictors such as history of parental conflict, level of study, satisfaction with life, satisfaction with course, and alcohol consumption were significantly ($p > 0.05$) associated with mental distress. Satisfaction with life was found to be strongly associated with mental distress in our study as well, Similar findings have also been reported by Canadian National Survey⁽¹⁵⁾, Ankara University⁽¹⁶⁾ and Mid-Atlantic university⁽¹⁸⁾.

Students start their professional journey based on their selected courses with high expectation and enthusiasm with a keen interest of gaining new information. As they progress with their courses this enthusiasm often gets dampened along with lack of satisfaction with course. This is significantly common in students with mental distress, a fact well supported

by a study in Turkish university, which showed that mental stress is strongly associated with the student course satisfaction⁽¹⁷⁾. A similar study done in Wollo university stated significant correlation of alcohol intake with mental distress⁽¹⁹⁾. In our study, although females showed higher proportion of mental distress (25.6%) when compared with males (17.7%), this association was not statistically significant. However a study done in University of Hargeisa, Somaliland showed statistically significant association between gender and mental distress.⁽²⁰⁾

Our observations revealed that inability to cope up with the course content was found to be significantly associated with mental distress, Similar findings have also been reported in studies conducted from Kolkata and New Delhi⁽²⁾⁽¹⁴⁾. Family history of mental illness, level of education and global satisfaction with life were other dominant risk factors associated with mental distress as observed in a study conducted among university students from New Delhi⁽¹⁴⁾. Risk factor identification observed in this study could be prospected as a potential risk factor for further studies⁽¹⁴⁾.

Limitation

The cross-sectional nature of the study and the use of the self-reporting method is a limitation of the study. Further, the study has been conducted in a single university and it limits the external validity of the findings. However, the research is not defeated its purpose.

Conclusion

Mental distress is common among university students they are either unaware of their situation or reluctant to seek help. But there is a need for care, assistance and counseling support which will provide further impetus for conducting multi-centric longitudinal studies for examining the causal hypothesis.

Conflict of Interest: None declared

Source of Funding: Self

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Evaluating the Pain Responses among Infants Receiving Rotavirus Vaccine Versus Oral Polio Vaccine Before the Administration of Pentavalent Vaccine with Inactivated Polio Vaccine: A Randomized Study

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Abstract

Background: Vaccination is the most common painful interventions in infants. Non-pharmacological interventions to alleviate pain rely on the inhibition of pain signaling.

Objective: To compare the acute pain response of the infants receiving oral rotavirus vaccine versus oral polio vaccine before administration of injectable vaccines.

Method: This was a randomized control study conducted for a period of six months at the immunization center of a tertiary care teaching hospital. Children who are receiving rotavirus vaccine, inactivated polio vaccine (IPV), Pentavac® [Diphtheria+ Tetanus+wholecellpertussis(DTwP) + Hepatitis B (Hep B)+ Hemophilus Influenza B (HiB)] and oral polio vaccine (OPV) belong to the age group of 6 to 14 weeks visiting the study site for routine immunization were included in the study. The enrolled subjects were randomized into group A and group B using blocked randomization method. The responses of the infants were video graphed for 10seconds before and 30seconds after giving the vaccination. The recorded videos were coded and given to a research panel for scoring the pain response of infants on the basis of modified behavior pain scale (MBPS). The pain response scores were compared between the groups.

Results: Mean post vaccination MBPS in group A was 7.72 ± 1.01 and in group B was 7.88 ± 0.90 . There was no statistically significant difference in pain response was found between group A and Group B children ($P 0.55$).

Conclusion: Sequence of administration of oral polio vaccine and rotavirus vaccine did not impact the pain response following the administration of Pentavac® and inactivated polio vaccine among infants.

Key words: Inactivated Polio Vaccine, Pain Response, Pentavalent vaccine, Rotavirus vaccine, Sequence of vaccination

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Introduction

Vaccination is the most common painful interventions in infants.¹ Newborns can perceive pain and respond to pain through facial expression, behavioral responses and physiological signals.^{2,3} Vaccination complications include increased behavioral and physiologic responses to pain, increased neural disorders, psychosocial problems, learning disorders,

poor adaptive behavior, future fear of injection, and long-term complications in brain development.⁴ With the increasing number of vaccines available, the number of injections a child gets has correspondingly increased. Clinicians have got important responsibility in eliminating pain and suffering when possible. There were many studies that described how to evaluate and treat acute pain in children using pharmacological and non-pharmacological interventions. pharmacological methods are most frequently used to prevent pain in infants. However, many analgesics have life threatening adverse effects and its use is questionable in infants. Opioids can have adverse effects including somnolence, and respiratory depression making it unsuitable for use in spontaneously breathing, opioid-naïve patients.⁵

Non-pharmacological interventions to alleviate pain rely on the inhibition of pain signaling. Pain arises from nociceptive transmission through small afferents to the spinal cord and then to higher brain nuclei and the cerebral cortex. Nociceptive signals are mediated by peripheral and central components that may facilitate or inhibit this input. Several neurotransmitters are involved in mediating nociceptive signals including substance P which facilitates transmission and endogenous opioid-based compounds that inhibit transmission.⁶ Non-pharmacological pain relief strategies are convenient, inexpensive and can be used without prescriptions, also are well tolerated by infants. Some of the non-pharmacological methods which proved to reduce pain are oral sucrose, breastfeeding, non-nutritive sucking, skin-skin contact, swaddling, cryotherapy, acupuncture, distraction, and music therapy.⁷⁻¹³ The present study was conducted to compare the acute pain response of the infants receiving oral rotavirus vaccine versus oral polio vaccine before the administration of injectable vaccines.

Material and Method

The study was planned based on the assumption that rotavirus vaccine blunts the pain response of injectable vaccines administered thereafter, as it is sweet in nature. This was a randomized control study conducted for a period of six months at the immunization center, department of Pediatrics, Jagadguru Shri Shivarathreeshwara hospital, Mysuru. The study site functions 7 days a week and receives vaccine supply through Expanded Program of Immunization.

Ethical clearance of the study was obtained from the Institutional Ethical committee before initiating the study. Children who are receiving rotavirus vaccine, inactivated polio vaccine (IPV) and Pentavac® [Diphtheria+ Tetanus+wholecellpertussis (DTwP) + Hepatitis B (Hep B)+ Hemophilus Influenza B (HiB)] and oral polio vaccine (OPV) vaccine belong to the age group of 6weeks to 14 weeks visiting the study site for routine immunization was the inclusion criteria. Parents or legally acceptable representatives who are unable to provide the informed consent were excluded from the study. The informed consent form was developed in local language as per the requirements of Indian Council of Medical Research (ICMR) Ethical Guidelines for biomedical research on human subjects. The enrolled subjects were randomized into group A and group B using block randomization method. Group A subjects received the vaccination in the order - rotavirus vaccine, Pentavac®, inactivated polio vaccine and oral polio vaccine. Group B subjects received vaccination in the order oral polio vaccine, Pentavac®, inactivated polio vaccine and rotavirus vaccine. A trained staff nurse who follows the standard immunization practice at the study site administered vaccines to all study participants. The responses of the infants were video graphed for 10 seconds before giving the vaccination and 30 seconds after giving the vaccination. The recorded videos were coded and given to a research panel for scoring the pain response of infants on the basis of modified behavior pain scale (MBPS). The research panel consisted of two clinical psychologists and two neonatologists. Panel members scored the pain response separately and the mean scores are considered for further analysis. Comparisons of mean scores of both the groups were done using independent sample t test.

Results

Study team approached 70 eligible children and explained the study procedures and enrolled 50 children with a response rate of 71.42%. Using blocked randomization technique, 25 children were enrolled to group A and 25 enrolled to group B. Boys were more enrolled into the study (58%) and 54% of the study population were enrolled at the age of 6 weeks. Demographic details of the study population are presented in Table I. The mean body weights of the enrolled children were 4.1 kilograms and 3.8 kilograms

for group A and group B respectively.

There was no larger difference in the scoring of various parameters in MBPS by the panelists. Neonatologists in the panel given same score for some parameters such as cry and movements in Group and Group B, which was 3 and 2.92 respectively. Even clinical psychologists gave almost similar score for cry (2.76 and 2.8) and movements (2.52 and 2.56) for group A and group B. Mean MBPS in-group A was 7.72 ± 1.01 with confidence interval of 0.19 to 1.40. Mean post vaccination in group B was 7.88 ± 0.90 with

confidence interval of 0.17 to 1.26. The differences in the mean of two groups were statistically not significant ($P 0.55$) implying that there is no difference in the pain response between 2 groups. The MBPS scoring of the study participants are depicted in Table 2. There were no immediate adverse events or complications observed following the vaccination in both groups. It was also observed that there was no statistically significant difference in the pain response of boys and girls and children belong to different age groups such as 6 weeks, 10 weeks and 14 weeks.

Table 1: Demographic details of the study population

Demographic details		Group A	Group B	Total (%)
Gender	Male	16	13	29 (58%)
	Female	9	12	21 (42%)
Age in weeks	6 weeks	13	14	27 (54%)
	10 weeks	11	9	20 (40%)
	14 weeks	1	2	03(06%)

Table 2: Scoring of Modified Behavior Pain Scale

Parameter	Finding	Points	Scores of Group A		Scores of Group B	
			*CP	**N	*CP	**N
Facial expression	Definitive positive expression (smiling)	0	2.04	2.2	2.16	2.32
	Neutral expression	1				
	Slightly negative expression (grimace)	2				
	Definite negative expression (furrowed brow eyes closed tightly)	3				

Cont... Table 2: Scoring of Modified Behavior Pain Scale

Cry	Laughing or giggling	0	2.76	3	2.8	3
	Not crying	1				
	Moaning quiet vocalizing gentle or whimpering cry	2				
	Full lunged or sobbing	3				
	Full lunged cry more than baseline cry (scored only if child crying at baseline)	4				
Movements	Usual movements and activity	0	2.52	2.92	2.56	2.92
	Resting and relaxed	0				
	Partial movement	2				
	Attempt to avoid pain by withdrawing the limb where puncture is done	2				
	Agitation with complex/generalized movements involving the head torso or other limbs	3				
	Rigidity	3				
Mean score			7.32	8.12	7.52	8.24
Overall Mean score \pm SD			7.72 \pm 1.01		7.88 \pm 0.90	
P Value			0.55			

Discussion

There have been studies done on how to modify and reduce pain associated with immunization.¹⁴ Most of the studies are based on pharmacological ways of reducing pain.^{15,16} Modifying vaccination technique preferably order of vaccination has got many advantages. It is easy to implement, requires less time and cost effective compared to other methods of pain reduction such as pharmacological method. Studies have shown that giving something sweet like sucrose solution decrease the pain response to the injectable vaccine administration.^{17,18} A study proposed that sucrose

reduces pain only during the young infant period but not after 4 month of age.¹⁹ This is because endogenous opioids are released that are activated by sweet taste and blunts pain response.²⁰ Conversely, as polio is bitter in taste, increased bitter taste sensitivity may increase perception of injection pain.²¹ In contrast, vaccines like Diphtheria+Tetanus+Pertussis (DTP) vaccine and Hepatitis B vaccine have got differences in physical nature. DTP vaccine is more likely to cause pain when compared to Hepatitis B vaccine.

Present study enrolled 50 infants of age group one and half to three and half years, 25 in each group formed

the sample size. A similar study was done by Taddio *et al.*, done in 2015, enrolled 120 infants of age group 2-4 months and 60 infants received rotavirus vaccine first and the remaining received sucrose solution first to evaluate the vaccine injection pain.²² Present study aimed at finding the difference between pain response of two different oral vaccinations, rotavirus vaccine and oral polio vaccine which is sweet and bitter in taste respectively followed by intramuscular injections. Taddio *et al* noticed no significant difference in MBPS between the infants who received rotavirus vaccine initially (7.4) and infants received sucrose solution initially (7.7) with a p value of 0.3. Taddio *et al* concluded by saying that rotavirus vaccine did not differ from sucrose solution in reducing injection induced pain. The primary objective in the present study was to compare the acute pain response during immunization in the two groups. The mean post vaccination MBPS in the infants who received rotavirus vaccine initially was 7.72 ± 1.01 and the infant who received oral polio vaccine initially was 7.88 ± 0.90 . The differences between the groups were not significant ($P 0.55$).

The present study couldn't prove the proposed hypothesis sweet rotavirus vaccine decreases pain response among infants by changing the sequence of vaccination. It is possible that the amount to stimulate is not adequate to produce endogenous opioids as rotavirus vaccine is given in smaller amount. Therefore there was no decrease in pain perception related to sequence of vaccine administered before parenteral vaccination. The administration technique would not have any impact on the pain response among the infants as all the vaccinations in the study was administered by a trained staff nurse.

Conclusions

Sequence of administration of oral polio vaccine and rotavirus vaccine did not impact the pain response following the administration of intramuscular Pentavac® and inactivated polio vaccine among infants of age group 6 to 14 weeks. A larger study needs to be performed to verify results by enrolling a diverse infant population, and multiple nurses and physicians administering vaccines.

Acknowledgement: Authors would like to thank the faculties and students and administrators of department

of pediatrics JSS Hospital for their support during study. Also, special thanks to the effort made by the staff nurse in completing study as proposed.

Conflict of Interest: None

Source of Funding: None

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Menstrual Characteristics among the Nepali Adolescent Girls

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Abstract

Background: Menarche is a milestone in a woman's life as it denotes the start of reproductive capacity. The experience of first menstruation is often horrifying and traumatic to an adolescent girl. Menstrual health has a close link with women's fecundity and other reproductive health risks. Women having appropriate knowledge regarding menstrual hygiene and safe practices are less vulnerable to RTI and its consequences. **Objectives:** The present study aims to find out menstrual characteristics and its association with socio-economic factor among a group of rural Nepali adolescent girls. **Materials and Method:** Data was collected from Nepali adolescent girls aged 10-16 years residing in the rural area of Sombaria village of West Sikkim. Data on age at menarche, menstrual characteristics and menstrual health were collected from 106 participants using structured schedule. **Results:** The mean age at menarche of the participants was 12.6±1.17 years. 76.6 percent of the participants have irregular periods. In present study, 85.8 percent of participants have premenstrual syndrome (PMS) like breast sore, legs cramps, mood swing and back pain. The heavy discharge and menstrual problems shows 30.1 percent and 69.8 percent respectively. **Conclusions:** The average age at menarche shows gradually increase with increasing the age of adolescent girls. Maximum numbers of participants show higher percentage of irregular period and premenstrual syndrome. The socioeconomic conditions especially the mother's education and family income did play an important role in determining the menstrual characteristics of the participants.

Keywords: Absorbents, menstruation, premenstrual, socioeconomic

Introduction

Menarche is a milestone in a woman's life as it denotes the start of reproductive capacity.¹ In general, menarche occurs between 11 and 15 years with a mean age of 13 years.² Onset of menstruation is an important aspect of reproductive health, which bothers many women on a regular basis due to their lack of knowledge of health aspect and cognitive immaturity.³ The experience of first menstruation is often horrifying and traumatic to an adolescent girl.⁴ Generally, menstrual characteristics include age at menarche, menstrual disorder, and irregularity in the menstrual cycle, premenstrual discomfort, menstrual discharge

etc.^{5,6,7,8} Age at menarche is affected by several factors such as general health and lifestyle, nutrition, physical activity, socioeconomic conditions, stress and genetic parameters.^{9,10,11} In India, poor menstrual hygienic practices lead to different kind of reproductive health issues.^{12,13} Women having appropriate knowledge regarding menstrual hygiene and safe practices are less vulnerable to RTI and its consequences.¹⁴ Proper hygienic practices such as the use of sanitary napkins and washing of genital area are essential during menstruation. Females of all age groups need to take care of their reproductive health by using soft and clean absorbents during their menstruation.¹⁵

Under this backdrop, the present study focuses on menstrual characteristics, socio-economic status of the family and issues related with menstrual health among the Nepali adolescent girls.

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Materials and Method

The present study was conducted among the Nepali adolescent girls aged 10-16 years residing in the rural area of Sombaria village of West Sikkim. Among the different Nepali communities, the majority of populations are Limbus followed by others sub caste of Nepali like Chettri, Sharam Rai, Manger, Bhujel. Majority of people in the area depend upon agriculture to sustain their life.

Data were collected from 106 adolescent girls during the month of November and December, 2018. Data on the age at menarche, health and hygiene, use of sanitary pad, pre menstrual syndrome, menstrual health problems and other menstrual hygienic practices associated with menstruation were collected from each participant. Data on menstruation such as irregular period (menstrual cycle length beyond 30 days or below 28 days interval), excessive bleeding (bleeding for more than 7 days) were collected through recall method. Data on menstrual health problems like urinary tract infection, allergy rashes, excessive bleeding during and after menstruation period was collected through interview method. Data on various socio-economic conditions such as age, education, parent's education, parent's occupation, family income, family type, type of house, sanitary etc. were collected from each subject. The data on income was divided into three groups-high income group (above 75th percentile), middle income group (between 50th-75th percentile) and low income group (below 50th percentile). The educational qualification of the mother was divided as illiterate (those who did not go to school), primary (those who attained class I to class V), and secondary (those who studied up to class VI and above). Since the higher secondary and graduate educations are very negligible in number, it was clubbed together with secondary education. The data collected were analyzed using MS-Excel software.

Results

The average age at menarche in all the age group was 12.6±1.17 (Table 1). Table shows that 76.6 percent of adolescent girls have irregular periods, whereas, 27.3 percent have reported regular periods. Majority of participants (85.8%) had the problems of premenstrual syndromes. The frequency of breast soreness, leg cramp, mood swing, stomach pain and back pain was 28.3 percent, 23.5 percent, 15 percent, 9.4 percent and 9.4

percent respectively. Maximum numbers of girls were nervous (66.0%) on first period. This was followed by reaction of emotional (13.2%) and painful (11.3%). The heavy discharge and menstrual problems shows 30.1 percent and 69.8 percent respectively.

Table 2 shows that 79.2 percent of adolescent girls took regular bath during their menstruation. Using of sanitary pad (69.8%) as mode of absorbent reported higher among girls followed by using cloths (20.7%) and both (9.4%). The frequency of 23.5 percent of participants reported restriction during their periods. Mother shows the higher frequency (56.6%) who informs their daughter about the first menstruation followed by sisters (33.0%) and friends (10.3%).

Table 3 shows that the average bleeding days was found same in the age group 14-15 years and 16 years and above. The higher frequency of girls who missed school during menstruation was found in age group 16 year and above (41.1%). This was followed by adolescent girls who missed school from age group of 14-15 years (25.7%) and 12-13 years (17.1%). The frequency of adolescent girls who did not missed school was found 83.7 percent, 74.2 percent and 58.8 percent in the age group 12-13 years, 14-15 years and 16 years and above respectively. Furthermore, total of 72.6 percent of girls from the different age regularly go to the school during their menstruation. Whereas, (27.3%) of girls missed their school during menstruation.

Table 4 shows the higher frequency of urinary tract infection (6.3%) and excessive bleeding (36.1%) was found among adolescent girls belonging to lower income family. However, the higher frequency of allergy rashes (42.5%) was found among girls belongs to middle income family. This was followed by adolescent girls belong to low income family (29.7%) and high income family (16.6%). The frequency of urinary tract infection was found 2.1 percent among girls belong to middle income family. The frequency of excessive bleeding was found more or less the same between adolescent girls belong to high income family (25.0%) and middle income family (25.5%). The absence of any kind of menstrual problems was reported higher among adolescent girls belonging to higher income family (58.3%), followed by middle income family (29.7%) and low income family (27.6%).

Table 5 illustrated that the higher frequency of urinary tract infection (6.6%) found among adolescent girls whose mothers are illiterate. However, higher frequency of allergy rashes (44.4%) and excessive bleeding (37.5%) was found among girls whose mothers attained primary and secondary respectively. The urinary tract infection in adolescent girls was more or less the same among those whose mothers attained primary

education (2.7%) and secondary education (2.5%). The frequency of allergy rashes among girls whose mothers are illiterate and secondary education was (33.3%) and (25.0%) respectively. The absence of any kind of menstrual problems was reported higher among adolescent girls whose mother attained secondary levels of education (35.0%), followed by illiterate mothers (33.3%) and primary educated mothers (27.7%).

Table 1: Distribution of menstrual characteristics of the participants of Sombaria village

Variables	N (%)
Average age at menarche	12.6±1.17
Irregular periods	
Yes	77(76.6)
No	29(27.3)
Premenstrual syndrome (PMS)	
Yes	91(85.8)
No	15(14.1)
Types of PMS	
Breast sore	30(28.3)
Leg cramp	25(23.5)
Mood swing	16(15.0)
Stomach pain	10(9.4)
Back pain	10(9.4)
Reaction on first periods	
Nervous	70(66.0)
Painful	12(11.3)
Emotional	14(13.2)
Heavy discharge	
Yes	32(30.1)
No	74(69.8)

Table 2: Hygienic practices at the time of menstruation of the participants of Sombaria village

Variables	N (%)
Regular bath Yes No	84(79.2) 22(20.7)
Mode of absorbents Sanitary pad Cloths Both	74(69.8) 22(20.7) 10(9.4)
Restriction on periods Yes No	25(23.5) 81(76.4)
Knowledge of menstruation Mothers Sisters Friends	60(56.5) 35(33.0) 11(10.3)

Table 3: Information related to days of menstruation of the participants of Sombaria village

Age groups of girls (Years)	Number of girls	Number of absorbents discharged per days	Number of bleeding days	Missed school during menstruation	
				Yes N (%)	No N (%)
12-13	37	3	3	6(17.1)	31(83.7)
14-15	35	3	4	9(25.7)	26(74.2)
16+	34	3	4	14(41.1)	20(58.8)
Total	106	3	4	29(27.3)	77(72.6)

$$\chi^2=5.62;df=2;p>0.05$$

UTI*= urinary tract infection, AR*= allergy rashes, EB*= excessive bleeding, AB* =absence of any kind of menstrual problem

Table 4: Association of family income with menstrual health problems of participants of Sombaria village

Total family income	No. of girls	Problems associated with menstruation			
		UTI* N (%)	AR* N (%)	EB* N (%)	AB* N (%)
High income	12	0(0.0)	2(16.6)	3(25.0)	7(58.3)
Middle income	47	1(2.1)	20(42.5)	12(25.5)	14(29.7)
Low income	47	3(6.3)	14(29.7)	17(36.1)	13(27.6)
Total	106	4(3.7)	36(33.9)	32(30.1)	34(32.7)

$$\chi^2=7.90;df=6,p>0.05$$

Table 5: Association of mothers' education with menstrual health problems of the participants of Sombaria village

Mothers Education	No of girls	Problems associated with menstruation			
		UTI* N (%)	AR* N (%)	EB* N (%)	AB* N (%)
Illiterate	30	2(6.6)	10(33.3)	8(26.6)	10(33.3)
Primary	36	1(2.7)	16(44.4)	9(25.0)	10(27.7)
Secondary	40	1(2.5)	10(25.0)	15(37.5)	14(35.0)
Total	106	4(3.7)	36(33.9)	32(30.1)	34 (32.0)

$$\chi^2=4.52; df= 6; p>0.05$$

Discussion

Menstruation is the hall mark of every girl. There are various factors which influence age at menarche which includes mother's age at menarche. The mother's menarcheal age is considered a good interpreter of the daughter's menarcheal age in non obese girls.¹⁶ In the present study, the average age at menarche was found to be 12.6 years which is lower than the study conducted among girls in Kalamoli (13.3 years), West Bengal (12.8 years) and Gandhinagar (16.1 years).^{12,17,18} Several factors such as lifestyle, food they intake, physical activities and socio economic conditions could

be explained for lower age at menarche in the study population. Age at menarche also influences menstrual hygienic practices because at the very early age at menstrual onset a girl could not be mentally ready to accept all the menstrual characteristics.

Present study shows that 79.2 percent of adolescent girls took regular bath and discharge their absorbents quite often. Similarly, 76.6 percent of girls has irregular period which is higher than the study conducted among girls 27.3 percent in Hyderabad.¹⁹ Girls do mostly have irregular menstrual cycles during early adolescence.^{20,21} A proper absorbent seems to be healthy hygienic

practices. The present study also reported that 69.8 percent of adolescent girls used sanitary pad as type of absorbent. Whereas, 20.7 percent of girls used cloths and 9.4 percent of girls used both the sanitary pads. A cloth is considered as pocket free and eco-friendly menstrual napkin. A study shows that used of cloths as type of absorbent does not always mean financial restriction; it has some traditional beliefs system such as problems related with disposal of menstrual wasted.²² Mothers are the key informants of their daughter regarding the matter of menstrual characteristics as found in other study at Gandhinagar.¹⁸

Adolescent girls either at school or home do discharge their absorbents quite often. The lesser percentage of adolescent girls do constrain from attending school during menstruation. A study conducted by Guerry found the lack of product is in fact the biggest contributor to absenteeism during menstruation.²³ Another study in Nepal shows that there were no separate toilets for girl in schools. Girls felt embarrassed to go in the same toilet for girls and boys.²⁴ The present study shows that the majority of girls have an average bleeding period of four days. In the study conducted in South India, the menstrual flow lasting more than seven days.⁸ Premenstrual syndrome like breast soreness, leg cramp, mood swing, and back pain are observed in present study. Maximum numbers of participants were nervous on their first menstruation. Restrictions are imposed by their family members of the participants during menstruation.

A socioeconomic condition and mother education plays an important role in problem associate with menstruation of the adolescent girls. Education of mother, awareness and knowledge regarding can contribute the adolescent girls to handle the bodily changes during period in adaptive and participative manner.²⁵ Poor literacy and socio-economic status of mothers have fuelled the inhibitions a mother has to talk her daughter regarding menarche and the significance of menstrual practices.¹ A study in Nigeria found that the majority of girls were using toilet rolls as mode of absorbent to catch menstrual blood.²⁶ The socio-economic variables seemed to influences the chance of having gynaecological problems.³ Higher frequency of menstrual problems such as uterus tract infection and allergy rashes are found in low income group in the

present study.

In conclusion, the present study was conducted to understand the menstrual characteristics among the Nepali adolescent girls of Sikkim. Irregular period and premenstrual syndrome are observed in higher percentage in the study population. Problems associated with menstruation such as urinary tract infection, allergy rashes, excessive bleeding etc. are also reported in the present study. These menstrual health problems are more common among girls from low income family and whose mothers are illiterate. Present study further indicates that mothers are pioneer sources of information to their daughter when it comes to educating their girl on reproductive health issues. Sister and colleagues are the secondary sources of information for the adolescent girls in Sikkim. The adolescent Nepali girls in the present study are more concerned about menstrual health and its consequences.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Clearance: Taken from Departmental Research Committee.

Acknowledgements: Authors are very thankful to the study participants of fieldwork area.

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Clinical Cure and Microbiological Eradication in Respiratory Tract Infections

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Abstract

Aims: To study the concordance between clinical cure and microbial eradication in severe respiratory tract infections.

Methods & Material: A prospective cohort study was done at a tertiary care teaching hospital. Patients above 18 years of age with respiratory tract infections confirmed with positive sputum cultures participated in the study. Microbiological eradication was considered complete when no microorganism was isolated on 2 consecutive sputum cultures.

Results: The number of valid cases was 102. The mean age of patients was 58.6±16.1 (range, 19-82 years). Complete eradication of microorganisms was achieved in 54.5%(n=55) cases. In 33% (n=34) clinically successful cases, strains like Pseudomonas, Acinetobacter and Klebsiella were not eradicated and were isolated at study end point on repeat sputum culture. Relapse was observed in 9.2% (n=9) cases. On multiple logistic regression to ascertain the impact of independent variables on dependent variable (clinical cure/ microbiological cure), it was observed that increasing age, odds ratio=1.66(95% CI, 1.34-2.03), patient's background OR=6.4 (95% CI, 0.68-63.4), ventilatory support OR=2.8 (95% CI, 0.4-22.4) significantly (P<0.05) influenced end stage clinical outcome. Increasing age, odds ratio=2.33 (95% CI, 1.56- 2.84) and ventilatory support OR=3.4 (95% CI, 2.46-4.66) significantly (P<0.05) influenced microbiological eradication.

Conclusion: Clinical endpoint and microbiological eradication correlated in 54.5% cases. Discordance or failed eradication was more frequent in infections with Acinetobacter, Enterobacter and Pseudomonas. Failure to eradicate microorganisms was commonly associated with emergence of resistance to antibiotics.

Keywords: Microbiological eradication; Clinical endpoint; Logistic regression; Antibiotic resistance.

Introduction

The success of an antibiotic treatment has traditionally been considered synonymous with good clinical response.¹ In respiratory tract infections, the appearance, persistence, or recurrence of infection due

to the initial causative organism during treatment clearly indicates an antibiotic treatment failure.

However, in respiratory tract infections, microorganism may still be isolated on culture, even after completion of antibiotic therapy and consequently, a good clinical response. Exacerbations of persistent lung infections are common-place and have been shown to result in significant morbidity and loss of lung function if not treated. Acquisition of a new strain of Haemophilus influenzae, Moraxella catarrhalis, or Streptococcus pneumoniae in the lung is associated with

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an increased risk of exacerbation.²

Most physicians however lack consensus whether they should go for microbiological eradication or clinical cure in lower respiratory tract infections. Universally accepted endpoints have not been defined. A study by Denessen et al was done to evaluate concordance between the two issues but failed to establish a significant relationship between microbiological eradication and clinical cure in patients with severe pneumonia.⁵

Active bacterial eradication is now considered as a strategy aimed at optimizing the treatment of infection while minimizing the risk of selection, carriage and spread of resistant strains. However, therapeutic choice becomes more limited as multi-resistant strains become more prevalent. Thus, local susceptibility patterns must be considered when choosing antimicrobial therapy.

There is paucity of literature regarding the association between the two dichotomous end points in severe blood stream infections. The aim of present study was to establish the association between clinical cure and microbiological eradication in patients receiving inhaled antibiotics for severe respiratory tract infections. The study is also aimed to determine the influence of independent variables like age, gender, background, ventilatory support, and follow up duration on microbiological eradication and clinical cure.

Subjects & Method

A cohort study was done at a tertiary care center. Patients with severe respiratory tract infections were invited to participate in the study. The study was performed between October 2017 to January 2019. Prior approval of the institutional review board and Ethics committee was obtained. Written informed consent was obtained from all participating patients.

Patients with severe lower respiratory tract infections, on inhalational antibiotics were evaluated for microbiological eradication and clinical endpoints at completion of treatment and follow-up period (for 2 weeks after antibiotic treatment). Demographic, microbiological and clinical factors affecting clinical cure and microbiological eradication were evaluated.

Inclusion criteria: Patients with sputum culture positive respiratory tract infections were included. The

minimum age for inclusion was 18 years.

Exclusion criteria: Patients with renal failure, and history of ototoxicity were excluded.

Primary outcome Measure: The correlation between microbiological eradication and clinical cure was the primary outcome measure.

Secondary outcome measure: Demographic, microbiological and clinical factors affecting microbiological eradication and clinical cure were secondary outcome measures.

Criteria proposed by the 'Infectious disease society of America' was used to evaluate microbiological outcomes. The society has suggested that microbiological eradication was considered synonymous with elimination of the organism determined by 2 consecutive negative sputum cultures; microbiologic persistence was failure to eradicate the causative organism; microbiologic relapse was the recurrence of the same organism within 5 days after discontinuation of treatment or during treatment after 2 consecutive negative cultures; superinfection was the development of new infection with signs and symptoms due to a new or resistant pathogen other than the original causative organism.⁶⁻⁷ All assessments were based on actual sputum cultures.

Statistics: Statistical analysis was performed using IBM, SPSS Statistics version 25 (IBM Corp., New York, NY). Descriptive data was expressed as mean \pm standard deviation unless otherwise stated. Patients' baseline underlying disease condition and demographic characteristics were compared with microbiological and clinical outcomes, respectively. Continuous data were compared using t-tests. A P-value <0.05 was considered statistically significant. The effect of demographic data on the clinical and microbiological outcomes was evaluated using Chi-square tests. A binary logistic regression model was constructed to predict factors (independent variables like age, gender, background, ventilatory support, follow up duration, and microbiology) affecting the study end point (dependent variable).

Results

The sample size of participants was 108. The mean age of patients was 56 ± 12.9 (range, 18-80 years). The difference in age between males and females was

statistically significant (independent t-test, $P=0.05$). There were 79 (75.5%) males and 29 (24.5%) females. The mean follow-up duration was 14 ± 2 (range, 14-16 days). The demographic profile of study participants is shown in Table 1.

The microorganisms isolated on sputum culture are depicted in Table 2. *Klebsiella pneumoniae* ($n=30$) was the most common isolate and *Citrobacter* ($n=6$), the least common isolate on culture. The clinical diagnosis of study subjects is depicted in Table 3. Chronic obstructive pulmonary disease ($n=33$) with secondary infection was the most common clinical diagnosis.

Ventilatory support was required in 24(24.5%) patients. Colistin (58, 59.2%) and tobramycin (40, 40.8%) were the systemically administered antibiotics in study participants. Nausea, hoarseness of voice, dryness, cough and sore throat were the commonly reported adverse effects to medication. Dryness of mouth (63.3%) was the most reported adverse effect to therapy.

At about 2 weeks follow up after completion of drug therapy, complete microbiological eradication was achieved in 55.5% ($n=60$) cases. In 36.1% ($n=39$) clinically successful cases, strains like *Pseudomonas*, *Acinetobacter* and *Klebsiella* were not eradicated and isolated at the end of antibiotic treatment. Relapse was observed in 10.1% ($n=11$) cases. Table 4 compares microbiological outcome and clinical outcome at study end point by microbiology.

The end-point clinical outcome was cure in 84 (85.7%) cases and death in 14(14.3%) cases. The end point outcome did not differ significantly (Chi-square tests, $P=0.133$) between males and females. The end point outcome did not differ significantly (Chi-square tests, $P=0.133$) in patients on Colistin as compared to Tobramycin.

The outcome (clinical cure and microbiological eradication) was significantly bad (Chi-square tests, $P<0.001$) in patients requiring ventilatory support than those without.

Patients with rural background had a significantly (Chi-square-tests, $P=0.019$) worse clinical outcome than urban patients.

The clinical diagnosis significantly influenced the end stage clinical outcome (Chi-square tests, $P=0.002$). The microbiological outcome at 2 weeks follow up differed significantly (Chi-square tests, $P<0.001$) from clinical outcome. Patience with persistence and relapse had a poorer outcome. There was a significant difference ($P<0.001$) between microbiological end stage eradication between different sputum isolates.

The binomial logistic regression model was statistically significant, $\chi^2(3) = 29.6602$, $p < .0001$. The model explained 71.1% (Nagelkerke R^2) of the variance in clinical outcome and correctly classified 90.4% of cases. The area under the ROC curve (Figure 31) was .820 (95% CI, .718 to .891), which is an excellent level of discrimination according to Hosmer et al. (2013). Sensitivity was 82%, specificity was 93%, positive predictive value was 74.2% and negative predictive value was 93.4%.

Increasing age, odds ratio=1.74(95% CI, 1.34-2.03), patient's background OR=7.2 (95% CI, 0.68-63.4), ventilatory support OR=3.1 (95% CI, 0.4-22.4) significantly ($P<0.05$) influenced clinical cure.

Increasing age, odds ratio=2.54 (95% CI, 1.56-2.96) and ventilatory support OR=3.6 (95% CI, 2.46-4.74) significantly ($P<0.05$) influenced microbiological eradication (Table 4).

Table 1. Sputum Culture Isolates

Isolate	Frequency	Percentage
Kleibsiella pneumonie	30	27.7
E. coli	20	18.5
Acinetobacter calcoacitecus	8	7.4
Citrobacter	6	5.5
Kleibsiella oxytoca	13	12
Pseudomonas aeruginosa	22	20.4
Acinetobacter baumani	9	8.3
Total	108	100

TABLE 2. Clinical Diagnosis

Diagnosis	Frequency	Percent
COPD with Secondary infection	68	62.96
Bilateral pneumonitis	24	22.2
Bronchial Asthma with secondary infection	10	9.25
CA Lung with Pneumonia	2	1.85
CA Larynx with pneumonia	2	1.85
Pulmonary Tuberculosis with Pneumonitis	2	1.85
TOTAL	108	100

Discussion

The results of this study suggest that there occurs gross variation between microbiological eradication and end stage clinical outcome in respiratory tract infections. Complete microbiological eradication was achieved in only 55.5% patients after successful completion of antibiotic course. However, in 36.1% of clinically successful cases, strains of Pseudomonas, Acinetobacter and Kleibsiella could still be isolated at the end of antibiotic treatment. In 10.1% cases, there was relapse indication development of resistance and failure of antibiotic treatment.

The exact reason for the discordance between clinical response and bacterial eradication in respiratory tract infections is not known. It is known fact that persistence of organisms in patients with satisfactory clinical response often exhibit resistance to antibiotics used to treat the initial infection; is it that we rely too much on clinical cure rather than bacterial eradication?

Kousalya et al conducted a study in rural South Indian population. Throat swab samples of 250 patients with upper respiratory tract infections were cultured. The authors found that out of 34 (14.91%) strains of Kleibsiella pneumonie, 19 (8.33%) Pseudomonas aeruginosa and

remaining haemolytic streptococci, *Escherichia coli* and *Haemophilus influenzae*, all *Staphylococcus* spp, were resistant to penicillin., ampicillin and co-trimoxazole. All the isolates were resistant to at least one antibiotic. The authors were of the opinion that surveillance of bacterial infections and monitoring their antimicrobial susceptibility pattern must be carried out not only in tertiary hospitals, but also in small hospital settings. Changing the antibiotic of main prescription periodically (every 6months/ 1 year) akin to crop rotation to increase soil fertility, could keep resistant organisms at bay in the wards. ^{8- 10}

Kiem et al collected data from three clinical trials involving 76 patients with severe pneumonia. Clinical success was considered as total or partial eradication of isolated organisms. They found that complete microbiological was achieved in 44% patients after completion of antibiotic regimen. In 56% clinically successful cases, strains of *Acinetobacter*, *Enterobacter*,

Pseudomonas, *Stenotrophomonas maltophilia* could still be isolated on repeat culture. Resistance to antibiotics was observed in 71% persistent strains and relapse in 7.6% cases. Out of these, non-eradicated organisms accounted for 70% relapsed cases. In comparison, we achieved complete microbiological eradication in 55.5% cases, but the relapse rate was significantly ($P<0.05$) higher (10.1% versus 7.6%) in the present study. This could be explained by a relatively higher sample size in our study and presence of patients with varied etiologies.

Ikemoto et al studied susceptibilities of bacteria isolated from patients with lower respiratory infectious diseases to antibiotics across Japan. The authors found that administration of antibiotics has changed the results of the frequency of isolation of bacterial species. Bacterial isolations before administration of antibiotics were as follows: *S. pneumoniae* 24.5%, *H. influenzae* 21.4%, *S. aureus* 18.4% and *P. aeruginosa* 12.2%. The frequencies of *S. aureus* decreased after antibiotics administration over 15 days, but the frequencies of *P. aeruginosa* was not affected. The frequencies of *P. aeruginosa* was 47.8% after administration over 15 days. ¹²

On binomial logistic regression, the present study found that increasing age, urban background and presence/absence of ventilatory support significantly

influenced end stage clinical outcome whereas increasing age and presence/absence of ventilatory support significantly influenced microbiological eradication, respectively.

In a prospective cohort study in Brazil, 773 adult patients in an intensive care unit on ventilatory support were evaluated. Multivariate analysis was done to identify factors influencing end stage clinical outcome and mortality. Ventilatory support was required for respiratory tract infections (27%), neurologic disorders (19%) and non-lung sepsis (12%). The authors found that increasing age, OR=1.03 (95% CI, 1.01-1.03), significantly ($P<0.05$) influenced end stage clinical outcome in patients with lung sepsis. This observation is similar with the present study.

In the present study, increased mechanical ventilation time significantly influenced both clinical outcome as well as microbiological eradication. In patients on ventilation, strains of *Pseudomonas* and *Acinetobacter* could still be isolated after satisfactory clinical response. ¹⁴

The present study had some limitations. The colony counts of pathogenic bacteria were not compared in patients with clinical and microbiological eradication. Secondly, the sample size though adequate was not representative of all respiratory tract infections. Antibiotic treatment regimens, and quality of supportive care could differ from developed countries standards.

In conclusion, there has been a sharp increase in the interest for antibiotic persistence in the past years in the background of growing concerns about antimicrobial resistance. Discordance or failed eradication was more frequent in infections with *Acinetobacter*, *Enterobacter* and *Pseudomonas*. Even in the absence of any antibiotic resistance, lung bacterial infections are hard to treat and tend to relapse. In this scenario, we should aim for both clinical cure and microbiological eradication

Ethical Clearance : Taken from Ethical committee of the Swami Vivekanand Subharti University.

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Validity and Reliability of Electronic Head Posture Instrument for Measurement of Cranio-Horizontal Angle, Craniovertebral Angle and Sagittal Shoulder Angle

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Abstract

Background: Forward head posture (FHP) means that the head is in an anterior position in relation to the postural line and it is considered to coexist with hyperextension of upper cervical spine, flattening of lower cervical spine, rounding of the upper back and elevation and protraction of the shoulders. Because of associated problems, assessment of head posture has become increasingly important in clinical practices in evaluating and designing treatment regimens.

For clinical diagnosis, angle measurements have been utilized as information for evaluating physical characteristics, determining the effects of rehabilitation and preventing injury induced by physical activity. There are various software's available for measuring angles, one of them being Surgimap. In recent years, angle measurements using Electronic head posture instrument (EHPI) have been clinically researched as new angle measurement methods for the forward head posture apart from photographic measurement methods. Thus, this study evaluated the validity and reliability of the EHPI in measuring Head posture angles with Surgimap photograhic method in young healthy subjects.

Methodology: Ethical approval for the study was granted and cross sectional observational study was conducted for validity and reliability at outpatient department. After written consent the subjects were made to understand the purpose of the study. Craniovertebral angle, Cranio-horizontal angle and Sagittal shoulder angle was measured using Electronic Head Posture Instrument and Photographic Method through Surgimap software. The research constituted of three researchers and intra rater reliability, inter rater reliability and validity was analyzed.

Results: Data analysis was done using SPSS 20.0 version and the statistical significance level was set at $p < 0.05$. Intra rater reliability was found to be $CHA = 0.95$, $CVA = 0.92$ and $SSA = 0.96$, Inter rater reliability was found to be $CHA = 0.98$, $CVA = 0.90$ and $SSA = 0.78$. Correlation between different angles was found as $CHA = 0.95$, $CVA = 0.79$ and $SSA = 0.62$.

Conclusion: EHPI is a valid and reliable tool in clinically assessing and evaluating CHA, CVA and SSA

Keywords: Head Posture, EHPI Smart Tool, Surgimap software, CHA, CVA, SSA

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Introduction:

Posture is the way a person moves, sits, and walks and is individually unique. It is also defined as the spine

being in a neutral position, with good posture being imperative for improved health.⁽¹⁾ Maintenance of posture involves muscles to contract, which enables the body to remain in both seated and standing positions. However, prolonged sitting or standing can have a detrimental effect on an individual's posture and lead to many postural abnormalities.⁽²⁾

Forward head posture (FHP) means that the head is in an anterior position in relation to the postural line.⁽³⁾ FHP is considered to coexist with hyperextension of upper cervical spine, flattening of lower cervical spine, rounding of the upper back and elevation and protraction of the shoulders.⁽⁴⁾ Forward head posture (FHP) is one of the most common cervical abnormalities that predispose individuals toward pathological conditions, such as headache, neck pain, temporomandibular disorders, vertebral bodies disorder, soft-tissue length and strength alteration and shoulder dyskinesia.⁽⁵⁾ Because of these associated problems, assessment of head posture has become increasingly important in clinical practices in evaluating and designing treatment regimens.

In physiotherapy practices, angle measurements have been used for assessing physical alignment and articular range of motion. In particular, for clinical diagnosis, angle measurements have been utilized as information for evaluating physical characteristics, determining the effects of rehabilitation, and preventing injury induced by physical activity. For a number of clinical practices, a goniometer is commonly used to measure the joint angles. However, clinical angle measurements using the goniometer have lower reliability and validity.⁽⁶⁾ Radiograph measurements (RMs) are strongly recommended for reliable measurements of several joint angles to improve the accuracy.⁽⁷⁾ However, radiographic measurement also has disadvantages such as radiation exposure, higher medical costs, and a specialized medical implementation site. Therefore, a non-invasive, simple, and low cost measurement method that has high correlation to RM would be beneficial for various clinical practices.

There are various software's available for measuring angles.⁽⁸⁾ Another software used for measuring angles is Surgimap. The present software has turned out to be a boon and is now being utilized in the medical field as well for measuring joint angles. The software is

also used for research purposes wherein digital -photo analysis is being done. A previous study has found that Surgimap software is a reliable method for measuring spinal postural angles in adolescents from different views in standing position from digital photographs.⁽⁹⁾

Lau and chiu (2009) have developed an Electronic Head Posture Instrument (EHPI) to measure craniovertebral (CV) angle. Its measuring scale is accurate to one decimal place, and the electronic sensor reads the angle automatically. Measuring craniovertebral (CV) angle is one of the common objective methods in assessing head posture.⁽¹⁰⁾

A previous study by Lau and chiu (2010) evaluated the criterion-related validity of the Electronic Head Posture Instrument (EHPI) in measuring the craniovertebral (CV) angle by correlating the measurements of CV angle with anterior head translation (AHT) by lateral cervical radiographs in patients with diagnosis of mechanical neck pain and was found to be a valid and reliable tool for measuring the head posture.⁽¹¹⁾

In recent years, angle measurements using Electronic head posture instrument have been clinically researched as new angle measurement methods for the forward head posture apart from photographic measurement methods. Head posture can be evaluated by measuring the craniovertebral angle (CVA), Craniovertebral angle (CHA) and Saggital shoulder angle (SSA).

Thus, this study evaluated the validity and reliability of the EHPI in measuring Head Postural Angles with Surgimap photograhic method in young healthy subjects.

Therefore, the present study aimed to demonstrate the following two research aspects using the measurement of head postural angles provided from the Electronic Head Posture Instrument:

(1) Criterion validity of EHPI and (2) inter-rater reliability and inter-rater reliability of EHPI.

Methodology

A cross sectional observational validity and reliability study was conducted at outpatient department of Shree Swaminarayan Physiotherapy College. Inclusions criteria are Age group between 18 to 22 both gender are included in this study. Participants were

excluded if they had musculoskeletal or neurological pathologies. Based on this criteria, a total number of 50 young healthy individuals participated in this study by simple random sampling. A written consent was taken from each subject. Following recruitment, the subjects were made to understand the purpose of the study concisely and clearly. Materials used in this study were measuring tape, weighing machine, Digital Camera, EHPI, Surgimap software and reflective adhesive markers. Craniovertebral angle, Cranial horizontal angle and Sagittal shoulder angle was measured using Electronic Head Posture Instrument and Photographic Method through Surgimap software.

Procedure:

The subjects were informed to stand erect with feet width apart. Clothing was rearranged so that neck (C7 spine) and shoulders are exposed; adhesive markers were placed on anatomical point **1**. First point from external canthus of the right eye, **2**. Tragus of the ear **3**. Spinous process of C7 **4**. A midpoint between greater tuberosity of humerus and posterior aspect of acromion process of shoulder. The angles were measured as:

1. Cranio-horizontal angle (CHA)- the angle formed at the intersection of horizontal line through the tragus of ear and external canthus of the eye was measured.

2. Craniovertebral angle (CVA)- the angle formed at the intersection of horizontal line through the spinous process of C7 and tragus of ear was measured.

3. Sagittal shoulder posture (SSA)- the angle formed at the intersection of horizontal line through C7 spinous process and the midpoint of greater tuberosity of humerus and posterior aspect of acromion was measured.

The research constituted of four researchers- who measured angles with Electronic head posture instrument and took lateral view photographs of the upper body for analysis in Surgimap software. For intra-rater validity the angles were measured by the same researcher twice on different sessions. For inter-rater reliability, the angles were measured on the same subject twice by the two researchers. One researcher analyzed the angles in lateral view photograph through surgimap software.

The angles measured by the EHPI which was composed of an electronic angle finder, a transparent plastic base, and a camera stand. The electronic angle finder 'SmartTool,' made by M-D Building Products, was fixed on a transparent plastic base. The combined SmartTool Angle Finder and the plastic base were mounted on a tripod camera. The participant was then asked to stand with his/her left shoulder in front of the EHPI. The participant was instructed to stand comfortably with his/her weight distribution evenly on both feet and to keep the eyes looking straight forward. He/she was then instructed to flex and extend the head three times and then rest it in a comfortable position. The therapist adjusted the EHPI until the two indicator lines were aligned with the markers. Three readings were taken by the researchers and an average was taken.

For photographic method, same angles were measured by placing the markers on respective sites as mentioned above. Images were captured by Digital camera which was mounted on adjustable tripod stand at a distance of 3 m from the subject's shoulder. The same image was inserted in the Surgimap software and angles were measured.

Validity and Reliability of EHPI was analyzed from the data collected.

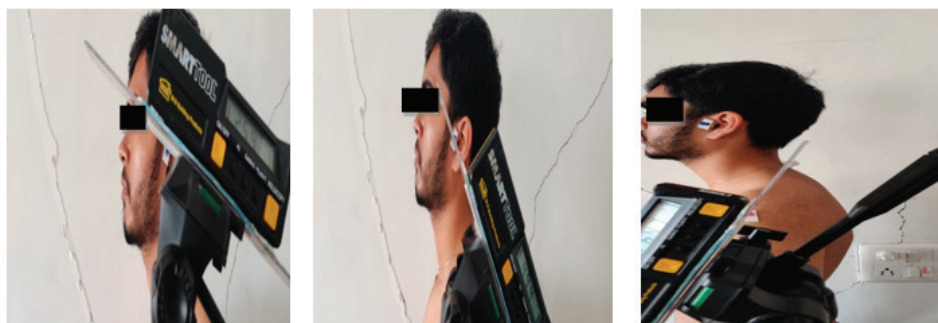


Fig: CHA, CVA and SSA using EPHI Smart Tool

Results

Data analysis was done using SPSS 20.0 version and the statistical significance level was set at $p < 0.05$. The study recruited 50 participants, out of which 26 males and 24 females were taken by simple random sampling. The scale from Bland and Altman was used in the classification of the reliability values (≤ 0.20 poor, 0.21–0.40 fair, 0.41–0.60 moderate, 0.61–0.80 good, and 0.81–1.00 excellent).⁽¹²⁾ Table shows inter-rater reliability of different angles and Table 2 shows the intra-rater reliability of different angles.

TABLE 1:- Inter-rater reliability of EHPI for CHA, CVA and SSA angles

Angle	Icc	Upper Limit	Lower Limit	Significance
CHA	0.98	0.99	0.95	0.001
CVA	0.90	0.97	0.60	0.001
SSA	0.78	0.94	0.13	0.016

At 95% confidence interval ICC for different angles is found as CHA=0.98 (Excellent), CVA=0.90 (Excellent), and SSA=0.78 (Good) for inter-rater reliability.

TABLE 2:- Intra- rater reliability of EHPI for CHA, CVA and SSA angles

Angle	Icc	Upper Limit	Lower Limit	Significance
CHA	0.95	0.98	0.82	0.00
CVA	0.92	0.98	0.71	0.00
SSA	0.96	0.99	0.85	0.00

At 95% confidence interval ICC for different angles is found as CHA=0.95 (Excellent), CVA=0.92(Excellent) and SSA=0.96 (Excellent) for intra-rater reliability.

The association between different angles measured by Surgimap method and EHPI was explored with Spearman's correlation coefficient. Table 3 shows correlation between different angles measured by Surgimap method and EHPI.

TABLE 3:- Correlation between different angles measured by Surgimap and EHPI

Angle	Spearman's Correlation Value
CHA	0.95
CVA	0.79
SSA	0.62

A Very High Positive correlation was found of CHA, a High Positive correlation was found of CVA and a Moderate Positive correlation was found of SSA. This result suggests that EHPI is a valid tool for measuring head posture angles.

Discussion

This study evaluated the Validity, Inter-rater and Intra-rater reliability for Electronic head posture instrument.

EHPI was found to be a valid tool for assessing head posture. This findings are similar to a previous study by Lau and chiu (2010) who evaluated the criterion-related validity of the Electronic Head Posture Instrument (EHPI) in measuring the craniovertebral (CV) angle by correlating the measurements of CV angle with anterior head translation (AHT) by lateral cervical radiographs in patients with diagnosis of mechanical neck pain and was found to be a valid and reliable tool for measuring the head posture. ⁽¹³⁾

The present study showed the high intra rater and high interrater reliability of EHPI. These results are similar to the previous study which showed a high intrarater (0.91–0.93) and interrater reliability (0.92–0.93) for both nondisabled subjects and those with neck pain. ⁽¹⁴⁾

Various disorders of cervical region like-upper cross syndrome, cervical spondylosis, kyphotic posture, PIVD, scoliosis can affect the surrounding musculature leading to postural changes in the cervical region. Amongst these changes, forward head posture is most commonly seen which not only leads to muscle imbalance but also reduces the cervical ROM. Electronic head posture instrument measures the angles similar to the photographic method but the major difference is EHPI is portable whereas the software requires either computer or laptop. The results showed that both the methods; EHPI and Surgimap photographic method has higher agreements on both the angles. These findings indicate the high validity of EHPI for evaluation of head postural angles.

In one of the previous study, the Head Posture Spinal Curvature Instrument (HPSCI), a noninvasive and simple instrument, was designed by Wilmarth and Hilliard. ⁽¹⁵⁾ The HPSCI is an inexpensive method to measure CV angle. Willford et al. demonstrated that it produced consistent and stable intrarater results (intraclass correlation coefficient [ICC] =0.9) across days and trials in 27 nondisabled subjects. ⁽¹⁶⁾ However, the accuracy of the instrument is limited to whole digits

only without decimal places because no marking exists between digits. In contrast, EHPI measuring scale is accurate to one decimal place, and the electronic sensor reads the angle automatically.

Electronic head posture instrument was found to have high validity, inter-rater reliability, and intra-reliability in the present study. Therefore, angle measurements using images taken in a certain distance from the subject were accurate for the definite angle. The results showed what angle measurements using images could use as criterion for validity, and it supported the legitimacy of high-quality previous studies that used photographic method as a criterion for validity.

One of the limitations of lateral photographic imaging to measure head posture is cumbersome and inconvenient to use in clinical practices. On the other hand, EHPI has high clinical benefits, such as being a simple, non-invasive technique and it is cost effective. Thus, EHPI can provide high-quality data in clinical studies and can be used as a criterion of validity for postural angles (CVA, CHA & SSA).

Age can be a major factor that can affect the results. This study included healthy adults aged between 18-24 years. Hence a study including higher and lower age group might be considered for future studies.

Also, in this study female to male ratio, i.e. gender effects as a confounding factor, on the reliability of measurements was not considered. According to the results and limitations mentioned above, it is suggested that studies can be conducted on different age group and gender group to eliminate confounding factors.

Conclusion

There is a strong association of head postural angles measured by EHPI and Surgimap Photographic Method which supports that EHPI can be recommended and is a valid and reliable tool in clinically assessing and evaluating head posture in terms of CHA, CVA and SSA.

Ethical Clearance- Taken from Shree Swaminarayan Physiotherapy College Local Ethics committee

Source of Funding- Self

Conflict of Interest - Nil

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Significance of Plain Xray Findings in Neck Pain with Relation to Cervical Radiculopathy and Myelopathy

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Abstract

Introduction: Pain neck is a very common symptom and associated with cervical spondylosis prevails in all individuals. Though this is an era of advanced MRI, the old technology of plain X-ray cervical spine still gives useful information in patients with pain neck. **Objective:** To study the plain X-ray findings in pain neck cases of neural causes.

Materials and Method: This was the cross sectional study conducted at Sri Manakula Vinayagar Medical College and Hospital over three years(January 2017-December 2019). Informed consent was obtained from all the patients included in the study. Institutional ethical committee clearance was obtained. All patients visiting the Out Patient Department (OPD) with the complaint of neck pain and back were advised to have plain X-ray cervical spine AP and Lateral views. The findings were recorded.

Results Of the 148 patients, 91 patients that are 61% of the patients with the neck pain, the plain X-rays were normal, except for mild Spondylotic changes. 25.6% (38 patients) had single level interbody space narrowing and in those patients common complaint was typical root pain. 4% (6 patients) had 2 or more level narrowing. 6% (8 patients) had cervical ribs of whom it was bilateral in 40% (3 patients). There were 2 cases of Klippel Feil interbody fusion (1.4%) and 3 cases had Spina Bifida (2%). Severe spondylosis with more than 3 level interspace narrowing was seen in 12 cases (8.1%) and all of them was over the age of 55.

Conclusion: Not all cases with neck pain need an MRI study. Plain X-ray cervical spine that is freely available even at the periphery can give valuable findings like interbody fusion, Spondylosis, cervical rib, congenital anomalies and those cases can be managed easily without unnecessary referrals in the initial stage.

Key Words: Spondylosis, Radiculopathy, interbody narrowing; lordosis; thoracic outlet syndrome.

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Introduction

Cervical radiculopathy is a pain and/or sensorimotor deficit syndrome that is defined as being caused by compression of a cervical nerve root.¹ The clinical manifestations of cervical radiculopathy are broad and may include pain, sensory deficits, motor deficits, diminished reflexes, or any combination of the above. Similarly, there are a variety of different pathophysiologic

processes that may result in dysfunction of the cervical nerve roots. An accurate history is a critical first step in the diagnosis of radiculopathy. Unlike patients with axial neck pain, patients with radiculopathy usually present with unilateral pain.²

When diagnosing a patient with radiculopathy, it is important to test for cervical myelopathy. Patients with myelopathy will present with upper motor neuron signs including hyperreflexia, changes in gait, and also have difficulty with fine motor tasks (changes in handwriting, buttoning shirts, etc.). Other pathologies that might be confused with cervical radiculopathy include peripheral nerve compression syndromes (e.g., median or ulnar nerve entrapment).

The clinical diagnosis of cervical radiculopathy may be confirmed by the presentation of root compression using MRI, which is the standard approach for identifying disk protrusions, while thin slices of spiral CT may be preferable to foraminal stenosis with bony compression.³

Imaging evidence should also be viewed in the clinical sense, as MRI in particular often generates false-positive findings that indicate abnormalities in asymptomatic patients.⁴ This also refers to simple X-ray results showing degenerative changes that arise with age contrary to clinical signs and symptoms and can thus be found redundant in a patient with cervical radiculopathy's routine diagnostic workup.⁵

Imaging (X-ray, computed tomography, magnetic resonance imaging, and myelography) as a convenient, quick, and practical method, has been widely applied in the clinical diagnosis of cervical spondylosis. Even though this is the era of MRI, many primary care physicians rely on plain X-rays. Plain X-ray film radiography remains the primary imaging modality of choice. The present study aimed to exploit the causes of

neck pain using plain X-ray as a diagnostic tool.

Materials and Methods: This was the cross sectional study conducted at Sri Manakula Vinayagar Medical College and Hospital over three years(January 2017-December 2019). Informed consent was obtained from all the patients included in the study. Institutional ethical committee clearance was obtained. All patients visiting the Out Patient Department (OPD) with the complaint of neck pain and back were advised to have plain X-ray cervical spine AP and Lateral views. The following patients were excluded from the study, Patients below the age of 20 as they are less likely to have degeneration, the trauma of any kind with fracture, tumors of both cervical spine and cord, fracture spine due to Trauma or tumor or tuberculosis, patients with any neurological deficit.

Results: A total of 148 patients were included in the study. Out of 148, 84 were females and 64 were males. The chief complaints that brought them for medical advice are as follows: Pain back of the neck, Pain radiating to one or both Upper limbs, Dull or diffused pain from neck to hand paresthesia and numbness, pain all over the body and joints. Stress and strain that precipitated or aggravate the pain. No definite cause or mode of precipitation.

There was complexity and overlapping of all these symptoms in more than 90% of these patients. Only 12 (8.2%) of them gave a typical history of root pain that is pain precipitated by unusual stress, radiating along a particular root from neck to hand, aggravated by stress and strain like Valsalva maneuver. Among them, 5 patients (42%) gave a typical history of lifting a heavyweight. One patient gave an unusual rare precipitating factor of severe cough after which he developed root pain. The findings noted in the plain X-ray are given in Table.1

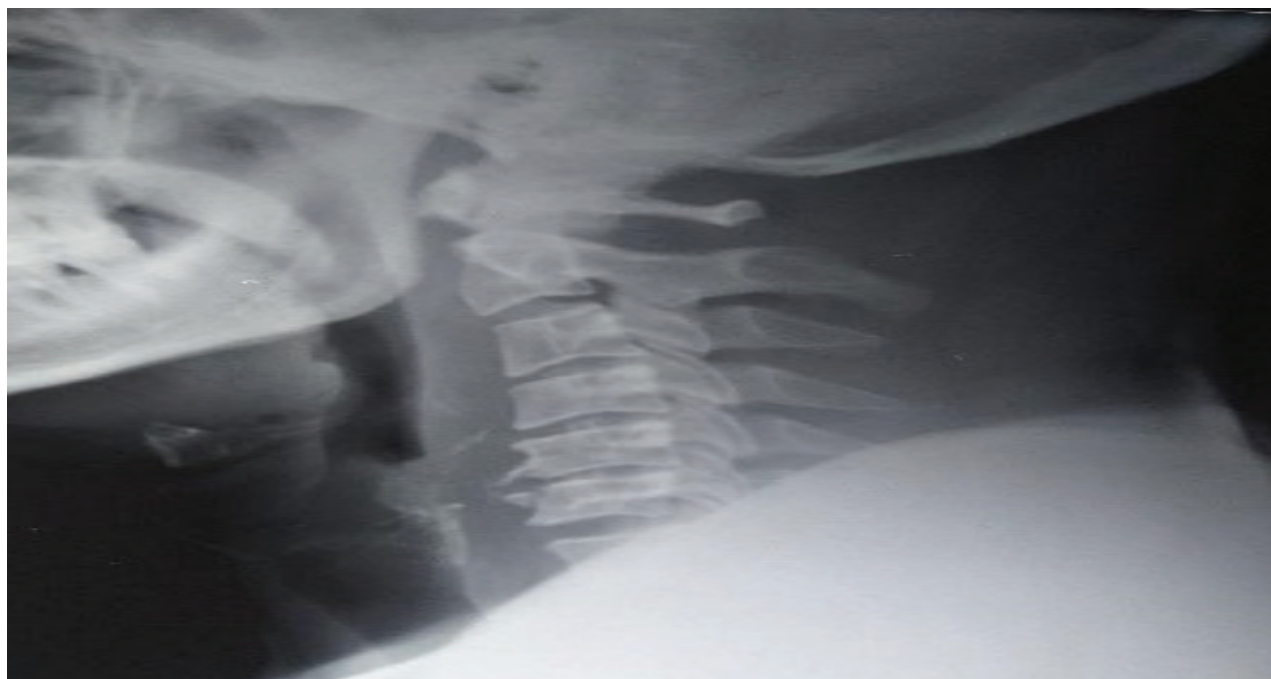


Fig 1: C5-6 interbody narrowing and osteophytes with loss of lordosis.

TABLE 1: Plain X-ray findings of patients with neck pain

Findings	No of Patients	Percentage %
Normal with mild spondylotic changes	91	61.49
Single space narrowing 2 and > 2 space narrowing	38	25.68
Cervical rib (40%) bilateral cervical rib)	8	5.40
2 and > 2 space narrowing severe spondylosis 8%,	6	4.05
Spina bifida	3	2.03
Klippel Feil interbody fusion	2	1.35
Total	148	100

All the cervical rib cases were females except 2 males. All of them had a diffused pain on one side with mild paraesthesia. Even the bilateral cervical rib patients had pain only on one side. Normal X-ray cases were that of those patients who had mild to moderate and vague pain in the back of the neck. The pain was not radiating to hand or back. In many of these patients there was no

spontaneous or precipitating factor for a radiating pain even though mild to moderate spondylotic degenerative changes like anterior or posterior osteophytes were noted in the X-rays.

The oblique view was taken in 6 cases with complaints of radiculopathy and whose AP and lateral views were

normal. In those cases the oblique view showed mild narrowing on the involved side at C4-5; C5-6; C6-7 on the symptomatic side. Similarly Flexion and Extension views were taken in whom they complained that the pain aggravated on flexing or extending the neck. In all those cases there was no evidence of instability and the X-rays looked normal with no antero or retro lysis MRI was done in 24 cases on whom surgery was planned and all those cases had disc prolapse with root compression as suspected with plain X-ray.

Discussion

In the present study, 61 % of the patients in our study had a normal X-ray with minor spondylotic changes. Patients with common radiculopathy had either one or more of the following: interbody space narrowing either in one or more levels; anterior or posterior osteophytes; beaking or lipping of the antero superior or inferior vertebrae, loss or obliteration of lordosis. It is best to search for related findings to rule out stenosis characteristics which can precipitate myelopathy later but not necessarily.

An annual occurrence of cervical radiculopathy was recorded at 107.3 per 100,000 males and 63.5 per 100,000 females at a rate of 50 to 54 years. Whilst most cases are self-limited, others are conservative treatment refractory. When patients have failed to control the cervical radiculopathy, several treatments can be used based on patient and surgeon factors.⁶

In our study, C5 and C6 were the most commonly affected levels. This is consistent with the findings of several previous studies showing that the C5-6 and C6-7 disc levels are the most susceptible to degenerative disease and resulting in nerve root impingement.⁷

There are over eight cases in the present sample that had cervical rib and in three of them, it was bilateral. It may be pain with radiculopathy due to the disk bulge that may occur during the spondylosis degenerative process. We should emphasize that in these cases quick X-ray of the cervical spine is easily helpful.

Markus Engquist et al., advises conservative treatment in the form of exercise therapy, therapy for neck stabilization, relaxation training, general exercise, and education.⁸ Muthukumar N suggested laminectomy;

laminectomy with lateral mass fusion and laminoplasty are the common surgical procedures for CSM (Cervical Spondylotic Myelopathy) with Cervical canal Stenosis.⁹ As per the study conducted by Rajshekhar V advises surgical management of a myelopathic patient should be based on clinical and radiological finding rather than surgeon's choice.¹⁰

Certain common things are observed during the study period such as, when a patient comes with the back of neck pain the differential diagnosis (DD) to be thought of are given below: DD in Radiculopathy: Cervical Spondylosis – Disc Prolapse, Fascitis of the neck, Myositis, nonspecific Myalgia, Periarthritis shoulder, Spinal tumors, Syringomyelia, Carries Spine, Thoracic outlet syndrome, Thoracic inlet syndrome, Fracture spine due to Trauma and Tumour, Myocardial infarction, Brachial neuritis, Median Nerve Neuropathy, Multiple sclerosis, Syphilis, Carpel Tunnel Syndrome, Shoulder depression syndrome, Polyneuropathy including Diabetic Neuropathy, Polyarthritis.

Cervical myelopathy caused by multilevel cervical spondylosis (CSM) and/or posterior longitudinal ligament ossification (OPLL) is a common clinical condition.¹¹ In people over 50 years old, CSM is the most frequent cause of acquired neurological illness. The disease's normal, untreated trajectory is usually bad. With adequate surgical care, however, the neurological defects can be corrected or at least stabilized and steps should be taken to ensure that the surgical procedure is cost-effective.¹²

Despite the prevalent incidence of cervical myelopathy, it is still a matter of controversy to select the correct surgical solution. It is disappointing that, given the multitude of specialist societies committed to the treatment of the spine, the specialists of spine surgeons have not been presented with definitive guidance on the option of approach to multilevel cervical myelopathy. To date, the choice of treatment depends in large measure on the experiences of the surgeon. It is clear that this approach is manifestly incorrect and more rational is a patient-specific and pathoanatomy-based approach.¹³

Cervical radiculopathy patient management is best done with an interprofessional team that includes a neurologist, neuro-orthopedic surgeon, physical therapist, nurse practitioner, and primary care provider.

Cervical radiculopathy therapy should be treated in a step by step way. There is still no evidence that surgery provides a definite benefit over non-surgical care in an emergency, while surgery may provide substantial relief. Within 8-12 weeks, more than 85% of acute cervical radiculopathy recovers without any different therapies.¹⁴

There is a growing movement in healthcare to reduce low-value care, including unnecessary and wasteful tests and procedures^{15,16} spearheaded by the Choosing Wisely™ movement¹⁷. Choosing Wisely™ works with healthcare organizations and patient groups to develop campaigns to address the overuse of tests that do not add value for patients and may cause harm.

Conclusion

A simple less expensive study of plain X-ray cervical spine gives an extensive and satisfactory finding that can be easily done in a peripheral set up without much sophisticated MRI or referral to a higher center. Other differential diagnoses can be also ruled out when one suspects radiculopathy due to spondylosis. Interspace narrowing, osteophytes, and cervical rib all can be easily made out.

Acknowledgment: The authors sincerely thank Professor & Head Dr.Kulasekaran, Radiology, Sri Manakula Vinayagar Medical College and hospital for their extensive moral and material (XRyas) support and encouragement.

Conflict of Interest: Nil

Source of Funding- Self

Ethical Clearance: Institutional ethical clearance was obtained.

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Salivary Omega6/ Omega 3 Fatty Acid Ratio And Dental Caries-Less is More

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Abstract

Background: Omega 3 and omega 6 are essential polyunsaturated fatty acids (PUFA) which cannot be synthesized in the body and needs to be obtained from dietary sources. The omega 6-omega 3 fatty acids ratio is important for human health, hence appropriate amounts of both these fatty acids should be considered for dietary recommendations. A ratio ranging between 2:1 to 4: 1 (Omega 6: Omega 3) has been stated to be the proper ratio by a summary of several nutritional estimation studies. However the relation to dental caries which is an infectious disease with multi-factorial etiology and is attributed to be the major reason for loss of tooth in children & adolescents, has not yet been explored. **Aim:** To assess and compare the salivary omega 6/omega 3 fatty acid ratio in children with varying levels of dental caries. **Methodology:** A total of 205 children aged 7-14 years were selected for the study. The children were grouped based on ICDAS-II classification system into Group I (Study group- 102 children) and Group II (Control = 103 children). Saliva samples were collected and subjected to Gas Chromatography to quantify all the fatty acids. The mean omega 6/omega 3 ratio was compared among the two groups. The statistical analysis was done by one-way ANOVA. **Results:** On comparing the mean fatty acids ratio among the study and control groups, no statistically significant differences ($p=0.313$) was noted. **Conclusion:** No statistically significant difference was observed on comparing the ratio of omega 6 to omega 3 fatty acids in the 2 groups.

Keywords: Omega 3, Omega 6, Saliva, Dental caries

Introduction

Nutrition, being a part of systemic health of an individual, plays an important role in maintaining

equilibrium between health and disease status. ¹These dietary nutrients have an impact on oral health status and can contribute as a major factor in improving oral inflammation and diseased conditions, thus enhancing the overall well-being of an individual. ^{2,3}Omega 6 and omega 3 are essential polyunsaturated fatty acids (PUFA) which cannot be synthesized in the body and needs to be obtained from dietary sources. ⁴ Omega 3 is a combination of alpha-linoleic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The main sources of omega 3 fatty acids are fish (seafood - salmon, mackerel, tuna) and fish oil

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beside the plant sources including soybean oil, canola oil, walnut and the seeds of flax, chia.^{5,6} Omega 6 is a combination of linolenic acid (LA), dihomo-gamma linoleic acid (DGLA), docosapentaenoic acid (DPA), gamma linoleic acid (GLA) and Arachidonic acid (AA). The major sources of omega 6 fatty acids are meat, egg yolk and vegetable oils.⁷

Both these polyunsaturated fatty acids are needed for growth and repair, and they play multiple roles in cell membrane structure, lipid metabolism, blood clotting, blood pressure, and in controlling inflammation.⁸ Literature states that these fatty acids also have an anti-inflammatory, anti-oxidant and antimicrobial activity.^{9,10} When compared to normal quantities in which omega 6 fatty acids are biologically active, larger quantities are toxic to health.¹¹

The omega 6-omega 3 fatty acids ratio is important for human health, hence appropriate amounts of both these fatty acids should be considered for dietary recommendations.¹² A ratio ranging between 2:1 to 4: 1 (Omega 6: Omega 3) has been stated to be the proper ratio by a summary of several nutritional estimation studies.⁸ When compared to the olden times of Paleolithic period, where a normal balance was seen in between omega 3 and 6 fatty acids, the present day human life has resulted in a drastic change in the diets of individuals which has consequently resulted in a paradigm shift in the amount and type of several antioxidants including omega 3 and 6 fatty acids and the same has been reported in several studies.¹³⁻¹⁷

Present day diet is rich in prepared and fast foods, which results in excessive amounts of omega 6 PUFA while lacking beneficial amounts of omega 3, thus resulting in a very high omega 6/omega 3 ratio (15:1), which can predispose to cardiovascular diseases, cancer, diabetes, neurodegenerative diseases.¹⁸

However the relation to dental caries which is an infectious disease with multi-factorial etiology and is attributed to be the major reason for loss of tooth in children & adolescents, has not yet been explored.^{19,20}

The amount of fatty acid of a person can be studied by analyzing various biological components namely, saliva, serum and adipose tissue.¹⁸ However the potential of saliva to estimate the levels of PUFA

remains unexplored. The use of saliva is considered to be more effective owing to the fact that the collection of saliva is a non-invasive procedure when compared to others which require invasive methods to acquire the specimens. The other added advantages being less cumbersome equipment required and ease of storage.

This study is done with the hypothesis that if the ratio of omega 6/omega 3 fatty acids are in the normal range there will be a decrease in dental caries levels and other inflammatory diseases.

Since there are no studies that correlate the ratio of omega 6/omega 3 in saliva and its relationship with dental caries, there is a need for this study.

Method

Source of Data: An observational (case control) study was conducted. A total of 205 children, both male and female (102 study and 103 control) aged between 7-14 years were selected after conducting a screening camp at Aided Holy Angels' Higher primary school, Thokkottu, Mangalore. Informed consent was obtained from the parents and school authority and assent was obtained from the children. Ethical clearance was obtained from the institutional ethical committee.

Inclusion Criteria: Children within the age group of 7-14 years with 3 or more carious teeth (ICDAS-II Code 3-6) and children who are willing to participate in the study with parental consent were included in the study group and children within the same age groups as controls. (ICDAS-II Code 0,1,2)

Exclusion Criteria: Children who have systemic diseases, children under any medications and children who are not willing to participate in the study and without parental consent.

Methodology

The children were grouped based on ICDAS-II system for measuring dental caries.

Group 1: Caries Group - 102 children with 3 or more carious teeth classified as Codes 3,4,5,6 under ICDAS – II

Group 2: Control group – 103 children with carious teeth classified as Codes 0,1,2 under ICDAS – II

Method of collection of saliva - 5 ml of unstimulated saliva was collected within a 10 minute period between 9 am and 11 am to minimize any possible effects of diurnal variation. Saliva samples were collected by passive drooling, in which subjects were asked to sit in a quiet environment in the “coachman position” and expectorate for 5 minutes in to sterile containers.

Saliva samples were transported to Central research laboratory, KSHEMA within 30 minutes and centrifuged at 4000 rpm for 15 min at 4 degree Celsius. The supernatants were stored at -80°C. Gas Chromatography was done to quantify all the fatty acids.

Statistical Analysis: Descriptive and analytical statistics were done. The data is represented in mean and standard deviation. The normality of continuous data was analysed by Shapiro-Wilk test. As the data followed normal distribution, parametric tests were used to analyse the data. The independent sample t-test and one

way ANOVA tests were used to check mean differences wherever appropriate. The level of significance was kept at $p < 0.05$.

SPSS (Statistical Package for Social Sciences) Version 24.0 (IBM Corporation, Chicago, USA) was used for carrying out statistical analysis.

Results

Out of the 205 salivary samples collected, omega 3 and omega 6 fatty acid levels could be estimated from only 60 (30%) and 72 (36%) samples respectively. Salivary omega 6/omega 3 fatty acid ratio was calculated only for those children where both these fatty acids were obtained. It was 12(11.76%) for Group 1 and 24 (23.3%) for Group 2. Due to this reason the remaining samples were not considered and the calculations are solely based on these samples.

Table 1: Comparison of mean omega fatty acids ratio between the two groups

Groups	N	Mean	S.D.	S.E.	M.D.	95% C.I.	t-value	P-value#
Group 1(Study)	12	0.75	0.37	0.10	-1.18	-2.72-0.34	-1.573	0.125
Group 2 (Control)	24	1.94	2.58	0.52				

#P-value derived from independent sample t-test

The mean fatty acids ratio (omega 6/omega 3) between the two groups was compared. It was found that there was NO statistical significant difference in mean fatty acids ratio ($p=0.840$) between the caries and control groups. [Table 1]

Discussion

Omega 3 and omega 6 PUFA have been widely studied for their beneficial effects on human health, mainly the brain, eye, cardiovascular system, and general human growth. Recent reports have noted that PUFA could improve oral health since they possess antioxidant,

anti-inflammatory and antibacterial activities. However, their utilization as antimicrobial agents has not been widely appreciated.²¹

Several studies evaluating the level of PUFA in serum are available in literature proving that fatty acid estimation is possible in serum.²² However, a standardization regarding the normal values has not been made. Serum estimation of fatty acid is a relatively invasive procedure that requires blood sample collection from the patient. If a suitable alternative procedure that is non-invasive is available, it would lead to ease in estimation of levels of PUFA. Since many of the

serum biomarkers are also present in saliva, it could be a suitable alternative for PUFA estimation as well.

To the best of our knowledge, this is the first clinical study using saliva for estimation of omega 6/omega 3 ratio and its correlation with dental caries. So, the present study was conducted to find whether such a correlation existed, and if present, to observe its relationship to dental caries. We expect it to open a new avenue for caries control.

Out of the 205 salivary samples collected, omega 3 and omega 6 fatty acid levels could be estimated from only 60 (30%) and 72 (36%) samples respectively. Based on these results, it is evident that not all children in our study showed the presence of omega 3 or omega 6 fatty acids in saliva. Still lesser number of children showed the presence of both omega 3 and omega 6 fatty acids in saliva. Salivary omega 3 and omega 6 fatty acids were both present in 12 children (11.76%) belonging to Group 1 and 24 children (23.3%) from Group 2. This shows that the presence of both these fatty acids could relate to the severity of caries in the children included in our study.

Studies have shown that omega 3 and omega 6 polyunsaturated fatty acids have anti-bacterial activity which could be attributed to the resemblance with the bipolar membrane of the bacterial cell wall due to having both a hydrophilic head and a hydrophobic tail. This similarity suggests that the target of these fatty acids could be the cellular membrane because fatty acids could possibly penetrate into the cell membrane of the bacteria disrupting normal cell²³

A direct comparison could not be made since no studies have been performed on dental caries and omega fatty acids.

The normal ratio of serum omega fatty acids (omega 6/omega 3) is reported to be between 2:1 to 4:1.¹⁹ Although several studies have evaluated fatty acid profiles in saliva, studies on omega fatty acids levels have not been carried out. So a comparison with standard normal ratio could not be done in our study. However when the mean salivary fatty acids ratio (omega 6: omega 3) between the study and control groups were compared, it was found that there was no statistical significant difference. This could be due to the

insufficient number of children exhibiting both omega 3 and omega 6 salivary fatty acids, for calculation of ratio in the different groups. These values cannot be relied upon to form any definite conclusions.

Conclusion and Future Recommendations:

1) With the available estimation methods, the omega 6 and omega 3 fatty acids could not be detected in the saliva of all the subjects in our study probably due to their insignificant levels in saliva. Tools with better precision are required for accurate estimation of omega 3 and omega 6 fatty acids.

2) Similar studies with larger sample size are required to establish the role of omega 3 and omega 6 fatty acids in dental caries definitively.

3) Once standardisation of estimation method and normative values are established, longitudinal studies and clinical trials using salivary omega 3 and omega 6 fatty acids may be undertaken.

Ethical Clearance: Taken from Institutional Ethical committee (NITTE Deemed to be) University

Source of Funding : Self

Conflict of Interest: Nil

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Clinical Profile of 46 Non AMD CNVM and Management with Anti-Vegf

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Abstract

Aim: To know clinical profile of non AMD CNVM in context to (Type, location, FFA, OCT characteristics Demography, incidence, causes)

To know clinical response to Anti-VEGF, conventional or PRN

Result:- Type: -14(30.4%) Myopic cnvm, 11(23.9%) Idiopathic cnvm, 9(19.5%) PFT, 4(8.7%) Inflammatory, 3(6.5%), choroidal osteoma with cnvm, 2(4.3%) Angiod streak, 2(4.3%) CSR with cnvm, 1(2.2%) Traumatic cnvm.

Location: - Extrafoveal (2), juxta foveal (14), Sub foveal (27), Peripapillary (1) (Angiod streak), Unifocal (42), multifocal (3) (PFT)

FFA:- 39(84.7%) classic, 4(8.7%) Occult cnvm, 3(6.5%) were undifferentiated. **CT:-**21(45.6%) type-2 membrane, 9(19.5%) undifferentiated, 2(4.4%) type -1 membrane **Demography:-**Average age 49.6 yrs, range (20 – 64 yrs); Male preponderance, M:F ratio is 1.3:1, Almost all had unilateral presentation except PFT (parafoveal telangiectasias) and myopic CNVM which bilateral.

Interpretation: - 6 cases responded to single dose. 10 responded to second dose of anti VEGF and 21 responded to 3rd dose. 9 were not responders to 3 dosages, given option of PDT with anti-VEGF. 2 cases responded to PDT. 1 case responded to high dose steroids with anti-Koch's in inflammatory CNVM. 4 cases remain non responded to treatment. 31(67%) had improvement in vision, 8(18%) had stable vision, while 7(15%) had deteriorated.

Conclusion: - Myopic CNVM cases showed 100% response after 1 to 3 dosages of anti-VEGF. Non-AMD cnvm cases respond well to anti VEGF alone, few more respond to added PDT. Inflammatory CNVM require high dose steroid

Keywords:- Optical coherence tomography (OCT), Fundus Fluorescein Angiography (FFA).

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Introduction

Choroidal neovascularization (CNV) may arise in association with several conditions other than AMD¹. These include pathologic myopia, uveitis, central serous chorioretinopathy, angiod streaks, choroidal osteoma, hereditary chorioretinal diseases, and iatrogenic disorders². The initial stimulus leading to the development of CNV is complex and varies according

to the underlying disease aetiology³. The occurrence of CNV associated with non-AMD conditions often affects patients at a younger age; therefore, some patients may develop work limitations leading to considerable financial losses and emotional distress⁴. Regardless of the inciting stimulus involved in the development of CNV, it is now well established that VEGF plays a major role in its pathogenesis⁵.

Inclusion Criteria:

Patient of age 20 – 64 years were taken

Exclusion Criteria:

- CNVM > 55 yrs. with drusen other eye AMD related cnvm or dry AMD
- Any CNVM received previous treatment.
- Media opacities where FFA is inconclusive.
- Follow up minimum 6 months.
- Cases clinically diagnosed as PCV; RAP were excluded.

Material and Methods

A hospital based clinical trial was done with 46 eyes of 41 patients was done.

Source of Data:

This study was conducted on patients attending outpatient department of ophthalmology in a tertiary care centre. It was conducted from NOV 2017 to MARCH 2019. This study was approved from institutional ethics committee.

Sample size: 46 eyes from 41 patients.

Results

TABLE 1 :

This table shows types of non- AMD CNVM from our study of 46 eyes, the different types are and with their percentages- 14 cases are of Myopic cnvm that is 30.4% following which Idiopathic cnvm cases are 11 that is 23.9% then PFT cases are 09 that is 19.5% following which Inflammatory cases are 04 that is 8.7%, then Choroidal osteoma with cnvm are 03 that is 6.5%

and Angiod streak cases are 02 that is 4.3% and CSR with cnvm are also 02 that is 4.3% and the least are Traumatic cnvm cases are 01 that is 2.2% .

Table 2:

This table contains information regarding the location of different types of non-AMD CNVM seen above and its percentage that is most common location is Sub foveal which is seen in 27 cases out of 46 that is 58.69% followed by Juxta foveal which is seen in 14 cases that is 30.4% then Extrafoveal location which is seen in 2cases that is 4.3% and the most uncommon location is Peripapillary which is seen in single case of Angiod streak.

Non -AMD CNVM cases are mostly Unifocal – 42 that is 91.3% and Multifocal are only 3 seen in parafoveal telangiectasia.

Table 3:

This table gives information about the patterns on Fundus Fluorescein Angiography seen in cases of non -AMD CNVM and the 39 cases that is 84.7% had predominantly classic pattern followed by 04 that is 8.7% cases had Occult cnvm and only 03 cases that is 6.5% were undifferentiated on angiography.

Table 4:

This table gives information of the patterns seen in Optical coherence tomography (OCT) in non – AMD CNVM.

But we could retrieve OCT of only 32 eyes so cases are accordingly that is 21 cases out of 32 that is 45.6% showed type-2 membrane followed by 9 cases that is 19.5% were undifferentiated on OCT , and only 2 cases out of 32 that is 4.4% had type -1 membrane.

TABLE 5:

This table deals with the treatment modalities and the number of cases actually responded to the which treatment and its percentages so all patients were exclusively given anti-VEGF(either Lucentis or Avastin) 29 patients primarily received Avastin, 17 received Lucentis and the patients those who had not responded to anti VEGF were given option of PDT or combination out of which 6 cases responded to single dose of anti-

VEGF which predominantly include myopic CNVM cases but 10 more responded to second dose which include Myopic, Idiopathic and PFT related cnvm but then 21 cases responded to 3rd dose of anti VEGF than 9 cases were not responded to 3 dosages, those were given option of PDT with anti-VEGF and also two responded after 5 dosages of anti VEGF and two cases responded to PDT which include Osteoma and idiopathic CNVM moreover one case responded to high dose steroids with anti-Koch's in inflammatory CNVM but out of 46 ,four patients remain non responded to treatment.

Table 6:

This table gives the idea of the visual outcome after the different treatment modalities given and the results are 9 cases had three line (Snellen) visual improvement till last follow up and 7 cases had two line improvement but 15 cases had only one line improvement and 8 had stable vision, but symptomatically better but lastly7 had drop in vision. So, the actual result is 31 cases that is 67% had improvement in vision and 8 cases that is 18% had stable vision while 7 cases that is 15% had deteriorated.

Results

Table 1 – On The Basis Of Type Of Non- Amd Cnvm: -

TYPES OF NON-AMD CNVM	NUMBER OF CASES	PERCENTAGE
Myopic CNVM	14	30.4
Idiopathic CNVM	11	23.9
PFT	9	19.5
Inflammatory	4	8.7
Choroidal osteoma with CNVM	3	6.5
Angiod streak	2	4.3
CSR with CNVM	2	4.3
Traumatic CNVM	1	2.2

TABLE :2 ON THE BASIS OF LOCATION :-

Location	Numbers	Percentage
Subfoveal	27	58.69
Juxtafoveal	14	30.4
Extrafoveal	2	4.3
Peripapillary	1	2.2
Unifocal	42	91.3
Multifocal	3	6.5

TABLE 3: ON THE BASIS OF FFA -ANGIOGRAPHY :-

PATTERN ON ANGIOGRAPHY	NUMBER OF CASES	PERCENTAGE
CLASSIC CNVM	39	84.7
OCCULT CNVM	4	8.7
UNDIFFERENTIATED	3	6.5

TABLE :4 ON THE BASIS OF OCT FINDINGS: -**ONLY 32 EYE OCT COULD BE RETRIEVED**

Oct Finding	Number	Percentage
Type-2 membrane	21	45.6
Undifferentiated	9	19.5
Type -1 membrane	2	4.4

TABLE 5: ON THE BASIS OF TREATMENT: -

Treatment Modality	Number of Cases Benefitted	Percentage
ANTI VEGF 1 DOSE	6	13.04
ANTI VEGF 2 DOSES	10	21.7
ANTI VEGF 3 DOSES	21	45.6
ANTI VEGF 5 DOSES	2	4.3
PDT	2	4.3
HIGH DOSES OF STEROIDS	1	2.1
NON-RESPONDERS	4	8.6

TABLE 6: VISUAL OUTCOME: -

VISUAL OUTCOME	NUMBER	PERCENTAGE
Improvement	31	67
Stable vision	8	18
deteriorated	7	15

Discussion

This study is a hospital based clinical trial was done with 46 eyes of 41 patients conducted on patients attending outpatient department of ophthalmology in a tertiary care centre. It was conducted from NOV 2017 to MARCH 2019. This study was approved from

institutional ethics committee. This study is performed to find out the different types of non-AMD CNVM and their location with respect to their location and patterns seen on Fundus Fluorescein Angiography (FFA) and OCT images. This study was done with principal aim to know the clinical profile of non AMD CNVM in

context to (Type, location, FFA , OCT characteristics Demography, incidence and causes and to know the clinical response to Anti-VEGF or conventional or PRN.

In our study the patient of age 20 – 64 with average age of 49.6 years were taken. In our study the cases of CNVM > 55 yrs with drusen other eye AMD related cnvm or dry AMD were excluded and any CNVM received previous treatment was also excluded to get better result regarding treatment. Cases with media opacities where FFA is inconclusive and Cases clinically diagnosed as PCV, RAP were also excluded.

In our study both the sex were taken into consideration out of the result which came out is Male preponderance of M:F ratio is 1.3:1. This study also gives the result that almost all had unilateral presentation except PFT (parafoveal telangiectasia) and myopic CNVM which showed the bilateral presentation.

In our study the number of cases taken are 46 and out of which the different types are and with their percentages- 14 cases are of Myopic CNVM that is 30.4% following which Idiopathic CNVM cases are 11 that is 23.9% then PFT cases are 09 that is 19.5% following which Inflammatory cases are 04 that is 8.7%, then Choroidal osteoma with CNVM are 03 that is 6.5% and Angiod streak cases are 02 that is 4.3% and CSR with CNVM are also 02 that is 4.3% and the least are Traumatic CNVM cases are 01 that is 2.2% .

The main aim of the study was also to get information regarding the location of different types of non-AMD CNVM seen above and its percentage that is most common location is Sub foveal which is seen in 27 cases out of 46 that is 58.69% followed by Juxta foveal which is seen in 14 cases that is 30.4% then Extrafoveal location which is seen in 2 cases that is 4.3% and the most uncommon location is Peripapillary which is seen in single case of Angiod streak.

The study also gives result regarding the Non -AMD CNVM cases that are mostly Unifocal – 42 out of 46 that is 91.3% and Multifocal are only 3 that are seen in parafoveal telangiectasia cases specifically. In our study of 46 cases information about the patterns on Fundus Fluorescein Angiography seen in cases of non -AMD CNVM is also correlated which comes out to that 39 cases that is 84.7% had predominantly classic

pattern shown in FFA followed by 04 cases that is 8.7% had Occult cnvm and only 03 cases that is 6.5% were undifferentiated on angiography which gives important part in discussion as FFA can be considered as an important diagnostic tool.

In our study the principal is also to note the pattern of non-AMD CNVM on OCT and to get the result according to information of the patterns seen in Optical coherence tomography (OCT) in non – AMD CNVM .

But we could retrieve OCT of only 32 eyes so cases are accordingly that is 21 cases out of 32 that is 45.6% showed type-2 membrane followed by 9 cases that is 19.5% were undifferentiated on OCT , and only 2 cases out of 32 that is 4.4% had type -1 membrane which gives an important result that type-2 membrane on OCT is most commonly seen in non-AMD CNVM.

In our study the role of anti -VEGF is also noted along with some different modality of treatment and the number of cases actually responded to which treatment and its percentages so all patients were primarily exclusively given anti-VEGF (either Lucentis or Avastin) 29 patients primarily received Avastin, 17 received Lucentis and the patients those who had not responded to anti VEGF were given option of PDT or combination out of which 6 cases responded to single dose of anti-VEGF which predominantly include myopic CNVM cases but 10 more responded to second dose which include Myopic, Idiopathic and PFT related cnvm but then 21 cases responded to 3rd dose of anti VEGF .

From the above treatment option 9 cases were not responded to 3 dosages of anti -VEGF so were given option of PDT with anti-VEGF and also two responded after 5 dosages of anti VEGF and two cases responded to PDT which include Osteoma and idiopathic CNVM moreover one case responded to high dose steroids with anti Koch's in inflammatory CNVM

After all treatment modalities it was noted that out of 46, four patients remain non responder to treatment. One of the very important result which comes out in our study is those who are Non-responder out of four patients, one had angiod streak, two had CSR with cnvm, & one had parafoveal telangiectasia and the common factor among three non-responders is presence of large serous PED with mottled RPE alteration.

In our study the last result comes out from the visual outcome after the different treatment modalities given and the results are 9 cases had three line (Snellen) visual improvement till last follow up and 7 cases had two line improvement but 15 cases had only one line improvement and 8 had stable vision, but symptomatically better but lastly 7 had drop in vision. So the actual result is 31 cases that is 67% had improvement in vision and 8 cases that is 18% had stable vision while 7 cases that is 15% had deteriorated.

Thus the cases of non-AMD CNVM was studied well on the basis of type, location , demography and findings on the basis of FFA and OCT and the role of anti -VEGF and visual outcome so most of the cases benefitted from the 3rd dose of Avastin and only 4 were non responders.

Conclusion

PFT related telangiectesia is not uncommon in our area which has female preponderance, multifocal location and bilaterally as classical presentation and respond well to anti VEGF. Myopic CNVM cases showed 100% response after 1 to 3 dosages of anti-VEGF. 85% had predominantly classic CNVM, 65% had type -2 CNVM on OCT. Non AMD cnvm cases respond well to anti VEGF alone, few more respond to added PDT ,67% cases shows visual benefit .Inflammatory CNVM require high dose steroid and more investigations . Non responders have shown common factor of large PED with RPE stippling, all are Occult CNVM on FFA and such cases needs ICG, which may turn out to be RAP, PCV.

Ethical approval: All procedures performed on human participants were in agreement with ethical standards of the Institutional and/or National Ethics Committee.

Source of Funding: Krishna instate of medical sciences

Conflict of Interest: None.

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To Study Various Complications Present amongst Metabolic Syndrome Patients and Control Subjects

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Abstract

Objectives: Metabolic syndrome (MetS) is a cluster of several metabolic disorders including hyperglycemia, reduced high density lipoprotein cholesterol, raised triglyceride level in serum, hypertension and abdominal obesity.

Methods: The present study was conducted at the MM Institute of Medical Sciences and Research. The study includes 300 patients with MetS as a case and 300 healthy volunteers as a control. MetS was diagnosed according to international diabetes federation.

Results: In our study 103 MetS patients of 300 have shown the complications like DM (Diabetes Mellitus), HTN (Hypertension) and obesity which are predisposing factors for atherosclerosis and other cardiovascular diseases which lead to morbidity and mortality.

Conclusions: Our study found that diabetes Mellitus, hypertension, dyslipidemia and obesity are the predisposing factors for metabolic syndrome.

Key Words: Diabetes Mellitus, Hypertension, Obesity, Metabolic Syndrome, Dyslipidemia.

Introduction

MetS is a group of signs and symptoms which include abdominal obesity, insulin resistance, and elevated blood pressure (BP). It is related to cause risk of chronic kidney disease, Type 2 Diabetes Mellitus, cardiovascular disease (CVD) and these diseases are important cause of mortality¹. Early identification of MetS is important because it raises the risk of CVD between 1.5 to 1.8 times more and raise relative risk of coronary artery disease and 4.2 fold a death². In persons with MetS, the prevalence of CVD increases 2-3 folds³.

International Diabetes Federation (IDF) defines MetS, as central obesity defined as waist circumference

(WC) ≥ 90 cm for men and ≥ 80 cm for women) along with presence of any two of the following⁴.

- Systolic blood pressure (SBP) ≥ 130 mm Hg or diastolic blood pressure (DBP) ≥ 85 mm Hg.
- Increased fasting blood Sugar (FBS) ≥ 100 mg/dl.
- Increased triglyceride (TG): ≥ 150 mg/dl.
- Decreased high density lipoprotein cholesterol (HDL-C): < 40 mg/dl in men, < 50 mg/dl in women.

Fast economic development with accelerating change in lifestyle, urbanization, nutrition, reduced physical activity and socio-economic status play key roles in the dramatic acceleration of MetS⁵.

MetS is very common among patients with type 2 diabetes mellitus. Participants who subsequently developed MetS had greater obesity, higher triglyceride.

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A study documented the pivotal role of obesity in the pathogenesis of MetS in different population⁶. A subject with abnormal glucose tolerance were analyzed, they displayed a higher BMI, blood pressure, triglyceride level, central obesity and lower HDL levels than normal glucose tolerance groups, all were the recognized features of metabolic syndrome⁷.

Aims and Objectives

1. Selection of the MetS patients and control subjects.
2. Measurement of SBP, DBP and WC in MetS patients and control subjects.
3. Assay of fasting blood sugar, triglyceride, and high density lipoprotein cholesterol in MetS and control subjects.

Materials and Method

The study has been conducted between February 2017 to August 2018

Study Area:

The present study was conducted in the Department of Biochemistry in collaboration with Department of Medicine, Maharishi Markandeshwar Institute of Medical Sciences and Researches, Mullana, Ambala, Haryana, India.

Study Population:

Group 1: 300 subjects with metabolic syndrome.

Group 2: 300 healthy Volunteers controls (age and sex matched) without metabolic syndrome.

Informed consent has been taken from the participants included in the study.

Inclusion Criteria:

- Patients with Metabolic syndrome above 18 years of age.

Exclusion Criteria:

- Familial hyperlipidemia
- Pregnancy

- Thyroid disease
- Any history of liver disease
- Lactation
- Oral contraceptives
- Recovery from non thyroidal illness
- Cushing disease
- Renal disease
- Patients with history of chronic drug use (steroid treatment, antidepressant and anti psychotic drug user)

Waist Circumference Measurement: WC was measured with a tape in a horizontal plane, mid way between the inferior margin of the ribs and the superior border of the iliac crest.

Sample Collection:

5 ml of blood sample was aseptically collected as per the standard guidelines and protocol. Serum was allowed to separate and subsequently analyzed for various parameters. FBS was assayed by glucose oxidase and peroxidase method, triglyceride by glycerol-oxidase peroxidase method and HDL-C by enzymatic assay method.

Statistical Analysis

Data obtained was analysed by using SPSS 21 version software and results was compared in cases and controls. P value < 0.05 was taken as significant at 95% confidence intervals. Student's t-test was used to find the association between thyroid profile and various components of MetS.

Result

The total number of patients in our study were 600 (100%) out of which 300 (50%) were healthy controls subjects and 300 (50%) were MetS patients. Among 300 patients with MetS in the study, 102 (34.0 %) were male and 198 (66.0 %) were female. Similarly there were 300 control subjects, out of which 102 (34.0 %) were male and 198 (66.0 %) were female.

Table 1: Anthropometric and laboratory finding amongst metabolic syndrome patients and control subjects.

Parameters	Control	Case	P Value
WC (cm)	80.49 ± 4.70	102.26 ± 7.92	<0.000
SBP (mm Hg)	115.31 ± 6.62	148.26 ± 21.24	<0.000
DBP (mm Hg)	76.31 ± 5.42	91.77 ± 10.96	<0.000
FBS (mg/dl)	79.35 ± 6.05	141.08 ± 56.02	<0.000
TG (mg/dl)	126.26 ± 14.76	167.0 ± 50.92	<0.000
HDL-C (mg/dl)	52.16 ± 6.33	37.79 ± 14.52	<0.000

The table 1 shows that the mean and standard deviation (SD) of WC for control subjects is **80.49 ± 4.70** cm and for MetS patients is **102.26 ± 7.92** cm. A statistically highly significant difference was observed among two groups (**p < 0.000**). The mean and SD of SBP for control subjects is **115.31 ± 6.62** mm Hg and for MetS patients is **148.26 ± 21.24** mm Hg. A statistically highly significant difference was observed among two groups (**p < 0.000**). The mean and SD of DBP for control subjects is **76.31 ± 5.42** mm Hg and for MetS patients is **91.77 ± 10.96** mm Hg. A statistically highly significant difference was observed among two groups (**p < 0.000**).

The mean and SD of FBS for control subjects is **79.35 ± 6.05** mg/dl and for MetS patients is **141.08 ± 56.02** mg/dl. A statistically highly significant difference was observed among two groups (**p < 0.000**). The mean and SD of triglyceride for control subjects is **126.26 ± 14.76** mg/dl and for MetS patients is **167.0 ± 50.92** mg/dl. A statistically highly significant difference was observed among two groups (**p < 0.000**). The mean and SD of high density lipoprotein for control subjects is **52.16 ± 6.33** mg/dl and for MetS patients is **37.79 ± 14.52** mg/dl. A statistically highly significant difference was observed among two groups (**p < 0.000**).

Table 2:- Complication present amongst metabolic syndrome patients and control subjects

Group		Frequency	Percent
Control	No Complication	300	100.0
Case	Dyslipidemia, HTN, Obesity	71	23.7
	Dyslipidemia, Obesity	21	7.0
	DM, HTN, Dyslipidemia, Obesity	78	26.0
	DM, HTN, Obesity	103	34.3
	DM, Dyslipidemia, Obesity	27	9.0
	Total	300	100.0

The above table shows that in control subjects no complication were present. In case 71 (23.7 %) patients had dyslipidemia, HTN, obesity, as a complication. 21 (7%) patients had dyslipidemia, obesity present as a complications, 78 (26%) patients had DM, HTN,

dyslipidemia, obesity as a complication, 103 (34.3%) patients had DM, HTN, obesity present as a complication and 27 (9%) patients had DM, dyslipidemia, obesity as a complications.

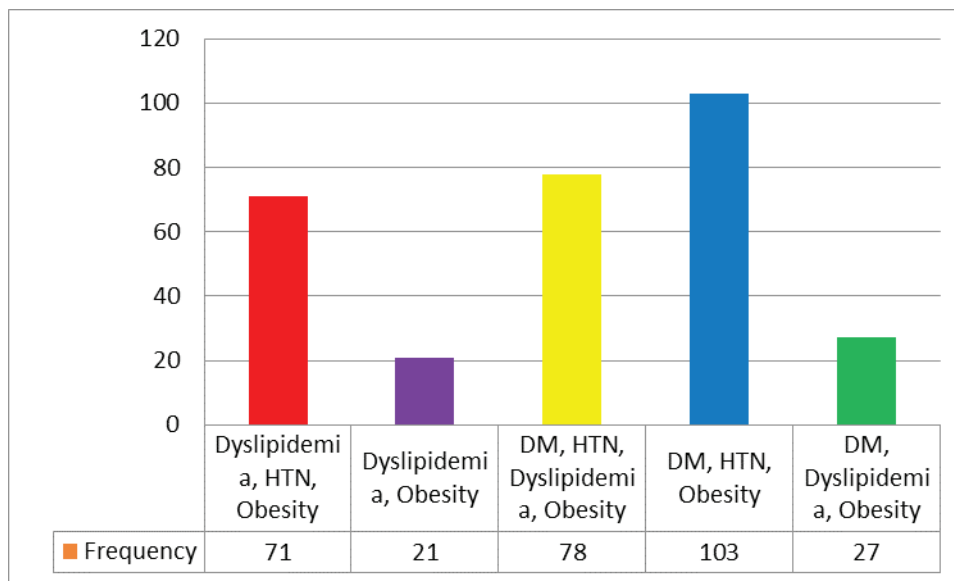


Figure 1:- Showing complication present amongst metabolic syndrome patients.

Figure 1 shows that complication present in metabolic syndrome patients. 71 (23.7 %) patients have dyslipidemia, HTN, obesity present as a complication. 21 (7%) patients have dyslipidemia, obesity present as a complications, 78 (26%) patients have DM, HTN, dyslipidemia, obesity present as a complication, 103 (34.3%) patients have DM, HTN, obesity present as a complication and 27 (9%) patients have DM, dyslipidemia, obesity present as a complications.

Discussion

In our study the mean WC (102.26 ± 7.92) was significantly higher in MetS patients than in control groups (80.49 ± 4.70) p (<0.000). The mean SBP (148.26 ± 21.24) was significantly higher in MetS patients than in control group (115.31 ± 6.62) p (<0.000). The mean DBP (91.77 ± 10.96) was significantly higher in MetS patients then in control group (76.31 ± 5.42) p (<0.000). The mean FBS (141.08 ± 56.02) was significantly higher in MetS patients when compared to control group (79.35 ± 6.05) p (<0.000). The mean triglyceride (167.0 ± 50.92) was significantly higher in MetS patients when

compared to control group (126.26 ± 14.76) p (<0.000). The mean HDL-C (37.79 ± 14.52) was significantly lower in MetS patients when compared to control group (52.16 ± 6.33) p (<0.000).

We have conducted a study to evaluate the major complications of metabolic syndrome. In our study, control patients had no complications. In metabolic syndrome patients, most commonly complications present were DM, HTN, obesity and the complications were present in 103 (34.3%) MetS patients, 78 (26.0%) MetS patients had DM, HTN, Dyslipidemia, obesity as complications, 71 (23.7%) MetS patients had Dyslipidemia, HTN, Obesity as complication, 27 (9.0%) MetS patients had DM, Dyslipidemia, Obesity as complication and 21 (7.0%) MetS patients had Dyslipidemia, Obesity as complications.

Conclusion

Our study advocate that diabetes Mellitus, hypertension, obesity, dyslipidemia are the predisposing factors for metabolic syndrome. To prevent from metabolic syndrome we have to control blood sugar,

blood pressure, waist circumferences and lipid profile, which are predisposing factors for atherosclerosis and other cardiovascular diseases which lead to morbidity and mortality.

Ethical Clearance: Taken from Institutional Ethics Committee vide letter no. 904 date 17.12.2016.

Source of Funding: Self

Conflict of Interest: Nil

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Hypoglycaemic Effect of Alcoholic Extracts of the Leaves of *Abroma Augusta* & *Gymnema Sylvestre* Plants in Type II Diabetes Mellitus Patients

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Abstract

Diabetes mellitus is the most common disease of the world causing much Morbidity. It is very evident that the incidence of this disease is rapidly increasing in both developed and developing countries. Also the mean age of acquiring the disease is lowering day by day. The Diabetes mellitus is classified into many types like, Type I / Juvenile, Type II / Non-insulin dependent, Gestational Diabetes, etc., But irrespective of the type affected, the patients suffer equally. India is having the largest Diabetic population of the world. So at this context the Natural Herbal Medicines which can have a Good Diabetic Control should be tested on the patients and reported effectively.

Leaves of *Abroma augusta* belonging to Malvaceae family is traditionally being used to treat Diabetes mellitus in India and Southern Asia. Thin-layer chromatography studies revealed the presence of Abromine (betaine), Triterpenoids, Flavonoids and Phenolic compounds in *Abroma augusta* L which are found to be Anti-diabetic. *Gymnema sylvestri* belonging to Asclepiadaceae family found in central and peninsular India is a potent Anti-diabetic plant used in folk, Ayurvedic and Homeopathic systems of medicine. *Gymnema sylvestri* leaves contain Gymnemic acids that have Anti-diabetic, Anti-sweetener and Anti-inflammatory activities.

These details intended us to carry out an Experimental Study on Type II Diabetes mellitus patients. The alcoholic extracts of *Abroma augusta* and *Gymnema sylvestri* were compared for their Hypoglycaemic effects by means of a Randomized Control Trial on Type II Diabetes mellitus patients which was executed with a Placebo control group for higher significance. Pre & Post Treatment Fasting Blood Glucose Levels were analyzed statistically. By the end of the study both the extracts showed Statistically good Hypoglycaemic effect with a P Value < 0.00001. *Gymnema sylvestri* (Mean lowering modulation – 29.03 mg/dL) has proved to be slightly more effective than *Abroma augusta* (Mean lowering modulation – 26.00 mg/dL).

Key Words: *Abroma.augusta*, Abromine, Betaine, Gymnemic acids, *Gymnema sylvestri*, Type II Diabetes Mellitus, Hypoglycaemic.

Introduction

Diabetes mellitus is the World's leading Non-Communicable disease and India is having the largest

Diabetic population of the world.^{1,2} Diabetes mellitus is a group of metabolic disorder involving carbohydrate, lipid and protein metabolism characterized by chronic hyperglycaemia, as a result of defects in insulin secretion from β – cells of pancreas or peripheral action of insulin or both.³ The Diabetes mellitus is classified into many types like, Type I / Juvenile, Type II / Non-insulin dependent, Gestational Diabetes, etc., But irrespective

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of the type affected, the patients suffer equally.⁴ This is often associated with other disorders like central obesity, hypertension and dyslipidaemia.⁵

The economic burden of diabetes mellitus and its complications are very high and increasingly affecting the lives of urban poor.^{6,7} Number of people with diabetes across the world has risen from 108 million in 1980 to 422 million in 2014. WHO projects that diabetes will be 3rd leading cause of death in 2030.⁸ It was estimated that India had 65.1 million adults with diabetes in 2013, and had the 2nd position among the top 10 countries with the largest number of diabetes. This number is predicted to increase to 109 million by 2035 unless steps are taken to prevent new cases of diabetes.⁹ Prevalence of impaired glucose tolerance is also high in the urban population. Subjects under 40 years of age have a higher prevalence of impaired glucose tolerance than diabetes. The important risk factors for high prevalence of diabetes include: High familial aggregation, obesity specially central one, insulin resistance and lifestyle changes due to rapid urbanization.¹⁰

Young-onset Type II Diabetes mellitus seems to be an aggressive disease owing to the rapid deterioration of metabolic function. This deterioration coincides with high levels of other risk factors for CVD and disease progression frequently leads to the development of microvascular and macrovascular complications at an early age, with associated premature mortality. These adverse outcomes occur at higher rates than in Type I Diabetes mellitus and late-onset Type II Diabetes mellitus.¹¹

Recent researches explore the effectiveness of many traditional herbs in treatment of Lifestyle disorders. 'Abroma agusta - Devil's cotton' and 'Gymnema sylvestre - Australian cowplant' are such herbs which are traditionally used in treating Diabetes mellitus.¹²⁻¹⁵ But only few researches have been carried out with these herbs in justifying their judicious use. These details intended us to do a comparative study of the effectiveness of the Alcoholic extracts of these plants in controlling serum glucose levels of Type II Diabetes mellitus patients with a placebo control arm.

Materials & Method

Methodology used was Single Blind Comparative

Experimental Study design of two parallel groups with a placebo control group. Patient Selection (Sampling) was made according to the following inclusion, exclusion criteria 30 patients were selected by Random Sampling Method. Both male & female Type II Diabetes Mellitus Patients belonging to the age group of 35 - 65 yrs³ with Fasting Blood Glucose levels more than or equal to 126 mg/dL³ were included in this study. Type II Diabetes Mellitus Patients with systemic complications & other systemic diseases were excluded. 'Systematic Random Sampling' method was adopted to assign patients in 3 Treatment Groups. Data collection was made by Case taking, Investigatory findings, Past history, Medical Reports & Diabetic Risk Screening Questionnaire.

Operational Design:¹⁶

As per the study protocol 30 Type II Diabetes Mellitus patients were selected randomly from Medical Unit IV of Vinayaka Mission's Homoeopathic Medical College Hospital, Salem, Tamilnadu in the period between 01.11.2016 to 31.12.2016. The Institutional Ethics Committee approval for this study was ordered on 26.10.2016. This Study was registered under Clinical Trial Registry of India with Reg. No: CTRI/2017/11/010528. The selection of cases was made on careful consideration of the Inclusion and Exclusion Criteria. The 'Case History' of each patient was recorded in a Standardized Case Format to evaluate and to rule out any co-morbid diseases or complications. 'Informed Patient Consent' in their local language was obtained from each patient. Then these selected patients were allotted equally in the 3 Treatment Groups by 'Systematic Random Sampling Procedure' such that each group carried 10 patients. Considered Treatment Groups were, **Group-A:** Alcoholic extract of *Abroma agusta*; **Group-B:** Alcoholic extract of *Gymnema sylvestre* & **Group-C:** Dispensing alcohol as Placebo. The Pre treatment Fasting Blood Glucose Levels of each patient were tested and recorded. Few patients were found already under other Medications for Diabetes mellitus; they were prescribed with placebo for a month and then included in the study.

Each patient was given their respective Treatment for at least 2 months i.e, 60 days. They were prescribed with 10 drops of their respective alcoholic plant extracts / Dispensing alcohol mixed with 10 ml of water orally

in morning and night every day after food. The Patients were blinded to know the name of the medicines they were prescribed with, by coding the medicines as A / B / C. Also the placebo was prescribed in the form of "Dispensing Alcohol" so as to make it similar to other extracts. All the patients were explained about 'Diabetic Diet' and advised to follow, which was closely monitored. The Fasting Blood Glucose Levels of each patient were tested at 3rd, 6th and 9th Weeks of Treatment. Some Sample Characters like Age Distribution, Gender Distribution, etc., were analyzed. This study was carried out during November 2016 to March 2017 at Medical Unit IV of Vinayaka Mission's Homoeopathic Medical College Hospital, NH 47, Sakari Main Road, Seeragapadi, Salem, Tamilnadu, Pincode - 636308.

Statistical Analysis of Outcome:

The Pre Treatment and Post Treatment (Average of 3rd, 6th and 9th Week Values) Fasting Blood Glucose Levels were considered for Statistical Analysis using "Analysis of Variance - ANOVA".¹⁷ The Statistical Analysis was prepared both manually and with the 'Statistical Package for Social Sciences.22 – SPSS' software.

Laboratory Investigatory Method / Procedure:

Fasting Blood Glucose Measurements were made by 'Glucose Oxidase - Peroxidase (GOD / POD) Method'. The Diagnostic Kit of 'Beacon Diagnostics Pvt. Ltd' was used for this. The Standard Normal Fasting Blood Glucose Value for this kit / method is ranging between 70 to 110 mg / dl.

Properties of the Plants:

Abroma augusta belonging to Malvaceae family, an evergreen shrub, is found throughout the hot and humid parts of India. Leaves and seeds of *Abroma augusta* are considered to be edible in India, South Asia and New Guinea. Its Leaves are used as a remedy for diabetes, inflammation, rheumatic pain of joints, uterine disorders, and headache. Thin-layer chromatography

studies revealed the presence of Abromine (betaine), Triterpenoids, alkaloids, steroids, triterpenes, flavonoids, megastigmanes, and phenylethanoid glycosides which are found to be Anti-diabetic.¹⁸⁻²⁰

Gymnema sylvestre belonging to Asclepiadaceae family found in central and peninsular India is a potent Anti-diabetic plant used in folk, Ayurvedic and Homeopathic systems of medicine. *Gymnema sylvestre* leaves contain Gymnemic acids that have Anti-diabetic, Anti-sweetener and Anti-inflammatory activities. It renders glucose lowering activity due to the presence of phytochemicals, such as gurmamin, gymnemic acid as well as gymnemasaponins. Its leaves are known to have anti-oxidant, antibiotic, anti-inflammatory, antiviral, gastro & hepato-protective, anticancer & lipid-lowering activities.²¹⁻²³

Alcoholic Extracts of the Plants:

The preparation of the alcoholic extract of leaves of *Abroma augusta* is to be done by macerating 1 part of freshly collected moist magma of its leaves with 10 parts of 95 v/v % alcohol for 14 to 28 days. The alcoholic extract of *Gymnema sylvestre* should be prepared by macerating 1 part of coarse powder of its leaves with 10 parts of 95 v/v % alcohol for 14 to 28 days. It should be shaken occasionally, and filtered. So obtained alcoholic extracts will be having the drug strength of 1/10 and this will be called as Homoeopathic Mother Tincture. Such prepared extracts should be standardized by using various physical, chemical and chromatographic parameters.²⁴ For this study the alcoholic extracts manufactured by Sharda Boiron Laboratories Ltd, SBL House, Commercial Complex, Shrestha Vihar, Delhi-110092, India were used. Sharda Boiron Laboratories Ltd is an ISO 9001:2000 certified company and the products produced by it are GMP certified.²⁵

Results

Observations:

Study showed a Maximum Prevalence of Type II Diabetes mellitus in the Age Group between 46 & 55 Years (56.67%) and in Males (66.67%).

Fasting Blood Glucose Levels of the Patients:

The Fasting glucose levels of the patients & their modulations before, during and after treatment in the 3 groups are shown in the Figure 1.

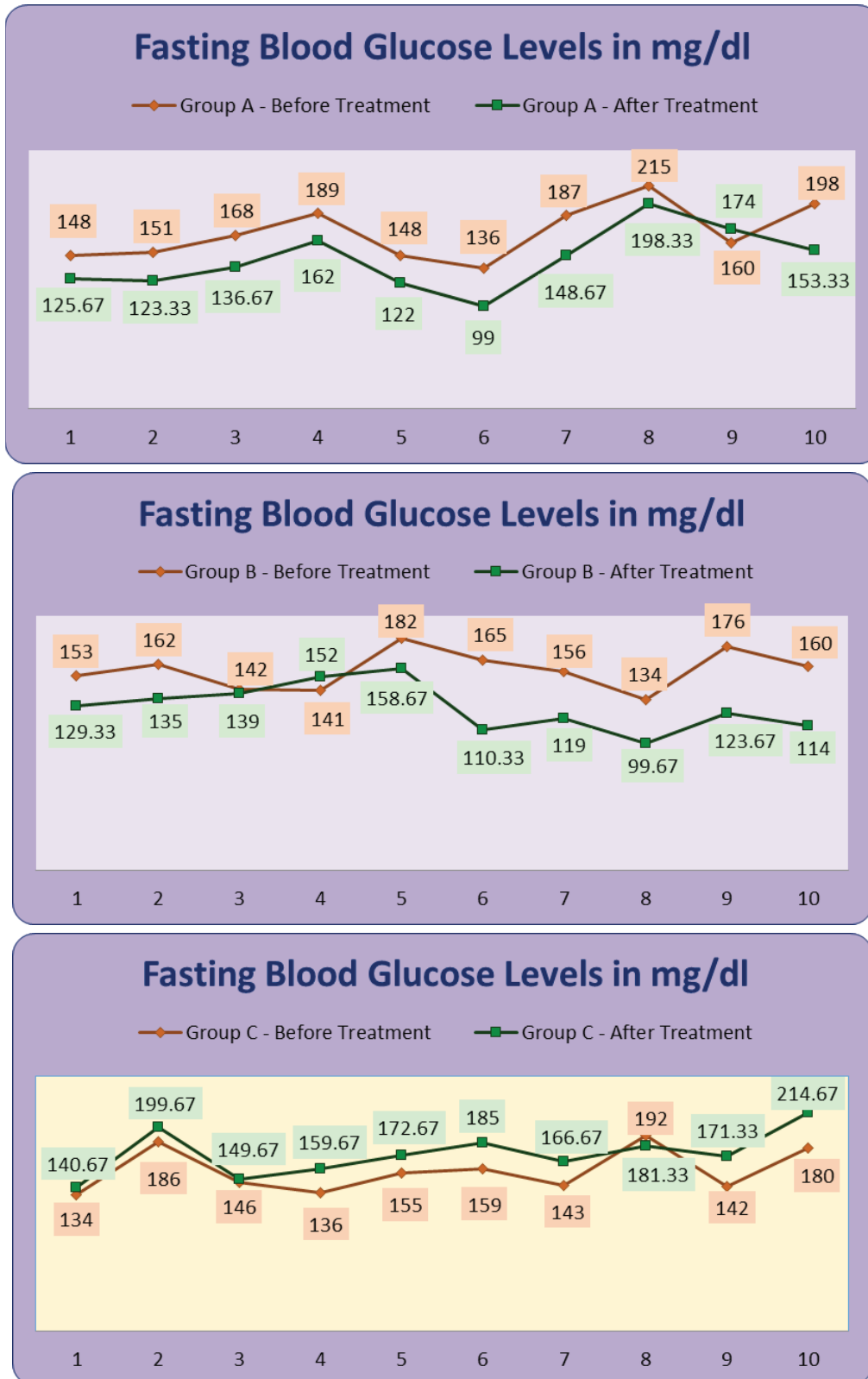


Figure 1. Fasting Blood Glucose Levels of Patients Before & After treatment

Descriptive Statistics:

Descriptive Statistics of Modulation of Fasting Blood Glucose Levels in mg/dL before and after Treatment is shown in Table 1 and Figure 2.

Table 1. Descriptive Statistics of Modulation of

Fasting Blood Glucose Levels in mg/dL before and after Treatment

	Minimum	Maximum	Median	Mean	Std. Deviation	Confidence Interval @ 95% LOS
Group A Before treatment	136.00	215.00	164.00	170.0000	25.92296	170.0000 ± 16.05
Group A After treatment	99.00	198.33	142.67	144.3000	29.07781	144.3000 ± 17.97
Group B Before treatment	134.00	182.00	158.00	157.1000	15.31484	157.1000 ± 09.48
Group B After treatment	99.67	158.67	126.50	128.0670	18.55604	128.0670 ± 11.46
Group C Before treatment	134.00	192.00	150.50	157.3000	21.38042	157.3000 ± 13.26
Group C After treatment	140.67	214.67	172.00	174.1350	22.25698	174.1350 ± 13.82

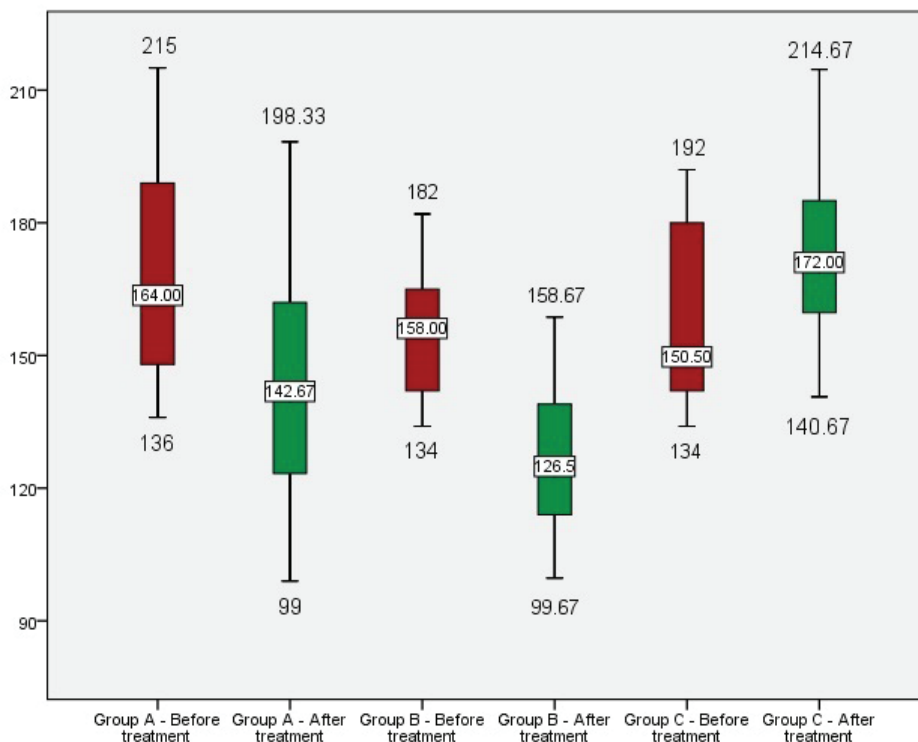


Figure 2. Box plot of Fasting Blood Glucose Levels in mg/dL

ANOVA Results:

‘Analysis of Variance’ of before & after treatment modulations in Fasting Blood Glucose levels between the groups is highly statistically significant both at 95% and 99% Confidence Levels with a P Value < 0.00001. Since the p Value calculated is < 0.00001, the modulation is highly significant and this is not due to any chance.

Discussion

Both the alcoholic extracts of leaves of *Abroma agusta* (26 mg/dL) & *Gymnema sylvestre* (29 mg/dL) have marked Hypoglycaemic effect. When compared *Gymnema sylvestre* had shown a slight more lowering effect than the *Abroma agusta*. The effectiveness of the Hypoglycaemic effects are graded as shown in the Figure 3. The Placebo Control Group C does not show any such effects.

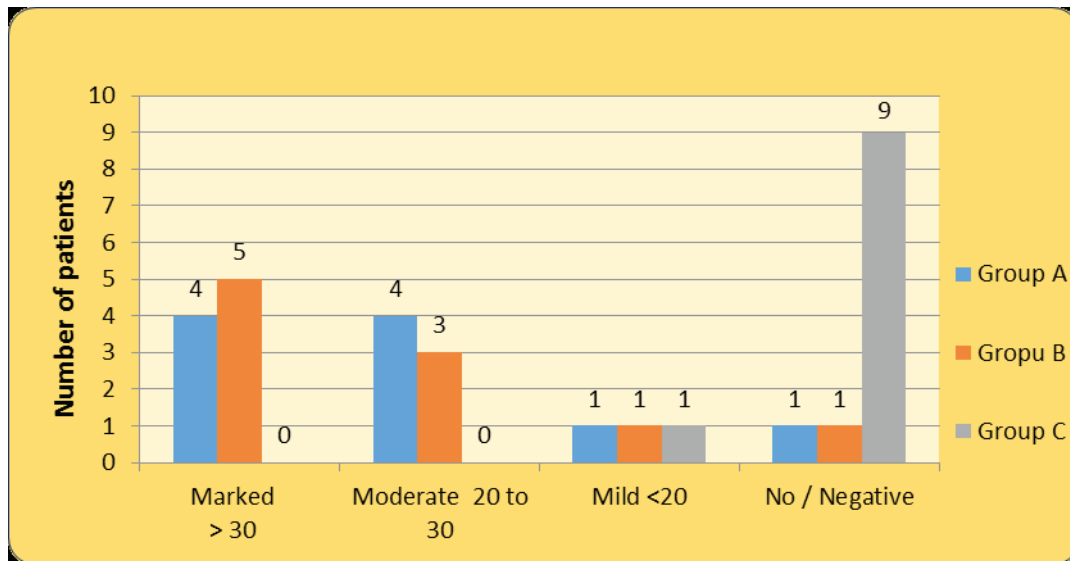


Figure 3. Grand Modulation of Fasting Blood Glucose Levels of the Patients

Conclusion

This ‘Single Blind Placebo Controlled Comparative Experimental Study’ proved that both the alcoholic extracts of the leaves of *Abroma agusta* and *Gymnema sylvestre* had a Good Hypoglycaemic effect on Type II Diabetes mellitus patients. Such that both the plant extracts can widely be used in the treatment of Type II Diabetes mellitus patients to maintain their blood glucose levels within normal range.

Ethical Clearance: Has been taken from the ‘Institutional Ethics Committee’ of Vinayaka Mission’s Homoeopathic Medical College and Hospital, Salem, Tamilnadu, India. (Ref.No: VMHMC/IEC/01/2016 dated 26.10.2016)

Source of Funding: Vinayaka Mission’s Homoeopathic Medical College and Hospital, Salem, Tamilnadu, India.

Conflict of Interest: Nil.

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Explore the Parental Determinants associated with Malnutrition among Children Under Five Years Residing in Rural Areas

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Abstract

Introduction: It has been estimated that each year death of about 2.3 million under five children in developing countries is attributed to malnutrition.¹ Rural Indian children are facing this problem of lethal evil more as compared to Urban children in India.

Objective: To explore the parental determinants associated with malnutrition among under five children in rural area.

Method: Descriptive survey approach was used for the study with cross sectional case control design. 166 underfive rural children between 6 months to 5 years of age, were selected by complete enumeration method from Bhagawati village, Bagalkot. The data regarding determinants was collected by structured interview schedule. WHO anthro Plus software was used to categories the children according to their Nutritional status. The association was explored by Chi square test, Fisher's exact probability test and Linear regression.

Results: Total 166 children were screened for nutritional status, in that 40 (24.10%) were found moderately underweight and 2 (1.20%) were severely underweight. A significant association was found between nutritional status of underfive children and Parental determinants: Mother's education, Mother's occupation, Mother's age at delivery, Presence of illness or health problem during delivery and Post natal illness and Father's educational status.

Conclusion: The findings revealed that better socio-economic status, mother's age, birth order, spacing, recommended exclusive breast feeding, early recommended supplementary foods, complete immunization and timely care seeking had positive effect on children health, which were also statistically significant.

Key words: Malnutrition, Underfive children, Parental determinants, breast feeding, Weaning.

Introduction

According to Assocham-EY report India is home to the largest number of malnourished children in the

world. The prevalence of underweight children was higher (38%) in rural areas compared to urban cities (29%). "Only about 10 per cent children under the age 6-23 months were reported to receive an adequate diet. In India the age bracket of 1-5 years, the prevalence of underweight children ranged from 42% in Jharkhand, followed by Bihar, MP and UP with 37%, 36% and 34.1% respectively, to 14.1% in Manipur. The report found that the prevalence of stunting ranged from 50.4% in UP to 19.4% in Kerala².

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Children in Rural India continue to consume non-nutritious, non-balanced food either in the form of under nutrition, over nutrition or micronutrient deficiencies, according to the report¹.

The World Bank estimates that India is one of the highest ranking countries in the world for the number of children suffering from malnutrition. The prevalence of underweight children in India is among the highest in the world, and is nearly double that of Sub Saharan Africa with dire consequences for mobility, mortality, productivity and economic growth.³

The 2017 Global Hunger Index (GHI) Report by IFPRI ranked India 100th out of 118 countries with a serious hunger situation. Amongst South Asian nations, it ranks third behind only Afghanistan and Pakistan with a GHI score of 29. The 2019 Global Hunger Index (GHI) report ranked India 102nd out of 117 countries with a serious issue of child wasting. At least one in five children under the age of five years in India are wasted.⁴

When it comes to child malnutrition, children in low-income families are more malnourished than those in high-income families. It is indeed necessary to explore the parental factors that contribute to malnutrition among under-five children. The nutritional status is ultimately associated with mental development and future life of the child; hence control of such factors in early life of a child can contribute to healthy future of a child preventing morbidities. Parents play the most crucial role in every child's life. Their contribution to child's health is of utmost importance. It is highly necessary to explore the parental factors that contribute to child's nutritional status.

Objective: The aim of the study was to explore the parental determinants associated with malnutrition among under five children in rural area by comparing cases and controls.

Hypotheses:

H₁: There is a significant association between parental determinants and Malnutrition among underfive children.

H₂: There is a significant association between nutritional status and extraneous factors of children under-five years

Method

Study design. It was a cross sectional study with case control research design. The study was conducted among 166 children selected from Bhagawati village, Bagalkot. Among 166 children 42 children with malnutrition were enrolled as cases and the remaining 124 children with normal nutritional status were enrolled as controls. **Cases:** The cases were identified by using WHO Anthro software. Children within the age group 6-60 months with weight for age Z score, less than -2SD, were considered as cases. **Controls** Controls were the children within the age group of 6-60 months, with weight for age Z score between -2SD to + 3D.

Setting of the study: The study was conducted in Bhagawati village of Bagalkot. It is located in the Bagalkot Tehsil of Bagalkot District in Karnataka. It is situated 16 kilometers from Bagalkot city. The total population is around 4,182. The data regarding children between the age group from 6 months to 5 years was obtained from 3 anganawadis in Bhagawati.

Participants: The study participants were underfive children and their parents residing at Bhagawati village of Bagalkot district. Bhagawati village of Bagalkot district was randomly selected as accessible population by lottery method and all the under five children residing in the Bhagawati village were enrolled as study sample.

Criteria for selection of sample.

Cases

Inclusion criteria: 1. under five children and their parents available at the time of data collection. 2. Parents of under-five children willing to participate in the study. 3. Parents of under five children who know to read/write kannada or English.

Exclusion criteria: 1. Children/parents who are hospitalized and cannot provide data. 2. Parents or children who are supposed to be out of the study area, during data collection. 3. Parents who are mentally challenged. 4. Children who are enrolled in any research study intended to improve nutritional status.

Controls

Inclusion criteria: 1 normal under five children and their parents available at the time of data collection.

2. Parents willing to participate in the study. 3. Parents of normal under five children who know to read/write kannada or English.

Exclusion criteria: 1. Children/parents who are hospitalized and can not provide data. 2. Parents and children who are suppose to be out the study area, at the time of data collection.

3. Parents who are mentally challenged. 4. Under five children who's Weight for age Z score is more than +3 SD. 5. Children who are enrolled in any research intended to improve nutritional status.

Selection of cases: As part of the study, children in the age group of 6 months to 60 months were screened by using WHO Anthro 3.2.2 software. The subjects were selected from Bhagawati village. The list of children was obtained by three anaganawadis. Anthropometric measurements like height and weight were done. The collected data was then entered in data sheet. 42 children were found as malnourished. Hence those 42 children and their parents were considered case group.

Selection of controls: Among 166 children screened 124 were found to be normally nourished with WFA Z score more than -2 SD. The children without malnutrition and their parents were considered as control group.

Sample Size estimation: sample size was estimated by using Epi info software based on results (mean and standard deviation) of a previous similar study conducted in India. The level of confidence was 95% ($\alpha=5\%$) and $Z\alpha=1.96$. The power of test was considered 80%. The sample size estimated by the statistician was 124. Considering attritions, all the available 166 children were enrolled in the study.

Description of data collection tool

The data collection instrument is divided into 2 sections.

SECTION A: It is divided into 4 parts: Part 1: Baseline factors: Part 2: Child nutritional status: Body weight and height/length of the child and WAZ- weight for age Z scores. Part 3: Child birth history: Part 4: Child present history: H/O any diarrhea at last fortnight H/O any illness or fever within last fortnight, H/O worm infestation in last 6 months, H/O any dewormification

in last 6 months.

Section B was divided into 3 parts: Part1: Parental General factors: present age, Age at the time of marriage, Educational qualification, Occupation, Nutritional status of mother and father, any present illness, Immunization of the mother during pregnancy. Part 2: Antenatal and postnatal factors: Regular health checkup, mother's age at the time of delivery, Any illness during pregnancy, mother's weight gain during pregnancy, Place of delivery, H/O any post natal illness, Gestational age at the time of delivery, H/O any abnormal event during pregnancy, H/O abortion before pregnancy of this child. Part 3: Breast feeding history: Exclusive breast feeding, Weaning was started at the age, When was breast feeding started after birth, Administration of pre-lactation goods, Breast feeding was administered up to the age.

Data Collection: Data collection was done from 16-01-2020 to 25-01-2020. Data collection was carried out in two phases- First phase: Data collection regarding Nutritional status of children Second phase: Data collection regarding Parental determinants.

Variables of the study: Dependent Variable: Nutritional status of the under-five children.

Independent Variable: parental determinants.

Statistical Analysis: The data was analyzed using SPSS 18 statistical package. Numerical data obtained from the sample, was organized and summarized with the help of descriptive statistics like percentage mean, and standard deviation. Association of parental determinants with malnutrition was assessed using Fisher exact probability test, Linear regression test and Chi square test were used to analyze association of malnutrition with socio demographic variables.

Ethical Consideration: Ethical clearance certificate was obtained from B.V.V.S Sajjalashree Institute of Nursing Sciences, institutional ethical committee. Written consent was obtained from each participant.

Results: The study was begun with selection of 166 children from 3 anaganawadis of Bhagawati village. All the children were screened for their nutritional status. Among 166 children 42 children were found as malnourished who were considered as cases and

remaining 124 normal children were considered as controls. The analysis was carried out according to objectives of the study.

Table No. 1 Classification of cases/controls based on level of malnutrition

Nutritional status	Weight for age score		Height for age score		Weight for height score	
	F	%	F	%	F	%
Normal Z=> -2SD	124	74.70	98	59.04	130	78.32
Mild/Moderate Z=< -2SD to -3SD	40	24.10	54	32.53	34	20.48
Severe Z= < -3SD	02	01.20	14	08.43	02	01.20
Total	166	100	166	100	166	100

Results related to association between baseline factors and nutritional status of children: A significant association was found between Nutritional status of under-five children and birth order ($P < 0.042$), Family monthly income ($P < 0.010$), Father's education ($P < 0.001$) and Number of siblings ($P < 0.041$). A significant association was found between malnutrition among under-five children and history of Diarrhea ($P < 0.001$) and fever/illness ($P < 0.024$) in last fortnight.

Table 2: Association between Parental determinants and Nutritional Status of under-five children.

SL NO	Ante natal and post natal variables	Df	Chi square value	p-value	Table value	Level of significance	Significance of association
1	Mother education	4	22.87	0.000	9.49	0.05	Significant*
2	Mother occupation	3	11.58	0.000	7.89	0.05	Significant*
3	Any present illness	1	0.109	.742	3.84	0.05	NS
4	Immunization of mother	1	0.148	0.701	3.84	0.05	NS
5	Regular health check up		2.42	.000	9.49	0.05	NS
6	Mother age at delivery	1	6.450	0.842	3.84	0.05	Significant*

Cont... Table 2: Association between Parental determinants and Nutritional Status of under-five children.

7	Any illness during pregnancy	1	17.145	0.000	3.84	0.05	Significant*
8	Place of delivery	3	4.378	0.039	7.89	0.05	NS
9	Post natal illness	1	8.637	0.000	3.84	0.05	Significant*
10	H/o any abnormal event during pregnancy	1	2.54	0.111	3.84	0.05	NS
11	H/o abortion before this child	1	3.168	0.009	3.84	0.05	NS
12	Father Education	4	13.367	0.001	9.49	0.05	Significant
13	Father occupation	4	3.182	0.186	9.49	0.05	NS

Results related to association between breast feeding practices and nutritional status of children

A significant association was found between Nutritional status of Underfive children and breast feeding practices; exclusive breast feeding upto 6 months ($p < 0.000$), Weaning started at 6 months of age ($p < 0.000$), Time taken to start breast feeding after birth ($P < 0.010$), administration of pre-lactational goods ($P < 0.005$) and administration of Breast feeding upto 24 months ($P < 0.000$).

Discussion

The aim of the study was to explore the parental determinants associated with malnutrition among underfive children. The data was obtained from 166 children in Bhagawati village. A similar study was conducted among 246 children and their parents (143 cases and 143 controls) attending tertiary care center Bikaner, Rajasthan.⁵

Total 166 children were screened for nutritional status, in that 40 (24.10%) were found moderately underweight and 2 (1.20%) were severely underweight.

Similar results were found in a community based descriptive cross sectional study in Pimpri Maharashtra where 263 (40.46%) under five children were stunted, 248 (38.15%) were underweight, 104 (16.00%) were wasted i.e. 34(5.23%) were having Severe acute malnutrition⁵

In case groups, 76.19% mothers in case group and 54.84% mothers from control group were between 22-25 years of age⁶.

A significant association was found between nutritional status of underfive children and Paternal Determinants: Mother's education ($P < 0.000$), Mother's occupation ($P < 0.000$), Mother's age at delivery ($P < 0.042$), Presence of illness ($P < 0.000$) or health problem during delivery and Post natal illness ($P < 0.000$) and Father's educational status (0.001).

Hence the hypothesis H_1 : There is a significant association between parental determinants and level of malnutrition among children under five years was accepted.

Similar results were found in a cross sectional study conducted to find out the factors associated with childhood malnutrition in Kapilvastu district, Nepal. Results showed that Better socio-economic status, mother's age (20-35 years), birth order up to second, gap more than two year between two pregnancies, recommended exclusive breast feeding, early recommended supplementary foods, complete immunization and timely care seeking had positive effect on children health, which were also statistically significant.⁷

A significant association was found between nutritional status of children and baseline factors hence the hypothesis H₂: There is a significant association between nutritional status and extraneous factors of children under-five years was accepted.

Limitations of the study: The study was confined only to exploration of Parental determinants associated with malnutrition among under five children. The study focused only on Under five children and their parents residing in rural area of Bagalkot.

Source of Funding: Grant for short term research 2019-20, from Rajiv Gandhi University of Health sciences, Bengaluru, Karanataka.

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Web-Based Application Development of Early Detection of High-Risk Maternal Referral System in the Islands Region (SIDILAN) in South Bangka Regency

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Abstract

Every pregnancy can develop into complications at any time; therefore, pregnant women need to monitor their health during pregnancy. Maternal problems/complications can be reduced or prevented by various improvement efforts in the field of obstetric health services. Failure in handling obstetric emergency cases is generally caused by failure to recognize early risk in pregnancy. Currently, there are many efforts as early detection of pregnancy risk factors, one of them is by using the Scor Poedji Rochyati Card method as a means of detecting pregnancy risk and as a recording and reporting system for midwives. Computerization is very helpful in the process of early detection and recording of reports for midwives in health centers/regions. This research developed a web-based application of early detection of high-risk maternal referral systems in the island regions (SIDILAN) in South Bangka Regency in 2018. This study uses a study *Quasi Experiment Design* with research design of *pre-post only group design*. The results of the study using the Willcoxon test and obtained a value of $P < 0.001$. It is found that SIDILAN has higher benefits compared to manual data recording and detection.

Keywords: *Pregnancy, early detection, application*

Introduction

World Health Organization (WHO) has launched the *Sustainable Development Goals (SDGs)*, replacing the previous *Millennium Development Goals (MDGs) program*, which was completed at the end of 2015. On the target of SDGs 3.1, which is to reduce maternal mortality globally in 2030 to 70 per 100,000 live births, where this target is to continue the program from the MDGs 5a target, which is to reduce 75% of maternal mortality rate from 1990-2015¹. Maternal mortality figures are indicators that reflect maternal health status, especially the risk of death for mothers during pregnancy and childbirth².

South Bangka Regency is part of the Bangka Belitung Islands Province, consisting of eight districts and three

villages. The population of South Bangka Regency according to data from the Central Statistics Agency of the Republic of Indonesia in 2014 was 194,686 people³. The maternal mortality rate in this region was 105.26 per 100,000 live births and decreased compared to the 2013 maternal mortality rate of 107.12 per 100,000 live births. Even though the maternal mortality rate has decreased over the past four years, this figure has still not reached the Millennium Development Indicator target Goals (MGDs) in 2015 which only amounted to 102 per 100,000 live births³.

Maternal death and illness can be reduced or prevented by various efforts to improve obstetric health services. Failure in handling obstetric emergency cases is generally caused by failure to recognize the risk of pregnancy, late referral, lack of means to care for high-risk pregnant women, lack of knowledge of medical personnel, medic and sufferers in recognizing high-risk pregnancies early, problems in obstetric services and economic conditions can cause maternal

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death⁴. Therefore, early detection by health workers and the public about the presence of risk factors and complications, as well as adequate treatment as early as possible, is the key to success in reducing maternal and infant mortality rates⁵. Scorecard in a simple format is easier to fill by health workers in order to screen pregnant women and classify mothers according to the problem so that they can determine in the process of decision making and appropriate interventions for pregnant women based on the card⁶. Other factors that influence the high maternal mortality rate are the late referral process and the unpreparedness of health facilities to conduct the comprehensive emergency obstetric services⁴. Poor infrastructure, inadequate transportation services, distances, and travel times that are too far from health facilities and dangerous social practices play a significant role in maternal mortality⁷.

With a good referral system, it is expected that cases with high risk can be handled more quickly, accurately, and sustainably, which in turn can lead to reduced maternal and child mortality as a benchmark for reproductive health services⁸. The scoring system can also be correct, but there are non-medical constraints, such as the term “Three Late”: late in decision making, late in transportation, late in getting. These occurrences are still prevalent and are a significant contributor to perinatal maternal mortality morbidity⁹. The referral process that is following procedural will speed up the handling of obstetric emergency cases. If the situation gets worse and cannot be handled, the health center will follow up by referring the woman to the regional hospital due to limited facilities and is not supported by obstetricians, so often patients with obstetric emergencies are referred again to hospitals that have facilities and infrastructure for obstetric emergencies¹⁰.

Thus, the task of a midwife is the key to success in reducing maternal mortality by making proper early detection and referring patients to the referral health facility quickly and accurately. The only obstacle encountered in the preliminary observations in South Bangka Regency is geography. The distance of the village health post to the health center is far, and some are located on islands that are separated from the mainland, such as Lepar Island and Pongok Island, making it challenging to report early detection and reconciliation manually. Therefore we need accommodative technology to solve

this problem. Under these conditions, the development of the High-Risk Early Detection Application, the web-based Maternal Provisions System (SIDILAN) for midwives in the South Bangka Regency, is an innovation to overcome this gap.

Method

The design of this study is a quasi-experimental study with *pre* and *post-test one-group design* research that the conclusions are obtained by assessing respondents before and after the intervention by learning about the use of pregnancy risk detection tools and the referral system. This research conducted in the South Bangka Regency Health Office, during January-October 2019. Collaboration with IT staff related to the concept and purpose of the model, the content of the model, and the use of the model is established. Included in this step is the preparation of supporting components to prepare guidelines and manuals. Then an initial product trial is carried out. The initial product/model draft will be tested on a limited sample of midwives who provide services at the community health center in the Toboali district. Respondents will be given a high-risk early detection application (SDILAN). At the time of the trial, the researcher made observations and, afterward, interviews with respondents. At revision stage, an evaluation of the results of the field trial will be carried out from assessing any deficiencies. From the evaluation results, improvements were made to improve the existing deficiencies. Testing was conducted on 32 respondents through a questionnaire, and interviews and results were analyzed.

Results

Pregnant Women Screening Data in the South Bangka Region

Based on the screening data of pregnant women in the South Bangka region, data on pregnant women with low risk are 83 pregnant women, 62 are at high risk, and very high risks are 18 pregnant women. Pregnant women with low, high, and very high risks are found in the Simpang Rimba Health Center, each at 46.9%, 82.2%, and 44.4%.

Table 1. Screening Data for Pregnant Women in the South Bangka Region

No	Name of Community Health Centers	Risk of Pregnant women		
		Low Risk	High Risk	Very High Risk
1	Toboali	11	12	2
2	Simpang Rimba	39	51	8
3	Rias	2	4	1
4	Pongok	0	0	0
5	Air Gegas	0	0	0
6	Air Bara	4	10	2
7	Tanjung Labu	12	17	2
8	Tiram	0	0	0
9	Payung	15	29	3
10	Batu Betumpang	0	0	0
TOTAL		83	62	18

Data on Pregnant Women who have Health Insurance Participation

Based on health insurance ownership data in the SIDILAN application, data obtained from mothers who had health insurance as much as 35.8% while those without health insurance as much as 64.2%

Table 2. Data on Pregnant Women who have Health Insurance Participation in the South Bangka Region

No	Name of Community Health Centers	Health Insurance Participation	
		Yes	No
1	Toboali	10	15
2	Simpang Rimba	32	66
3	Rias	4	3
4	Pongok	0	0
5	Air Gegas	0	0
6	Air Bara	7	9
7	Tanjung Labu	11	22
8	Tiram	0	0
9	Payung	17	30
10	Batu Betumpang	0	0
TOTAL		81	145

Data on Reference Types for Pregnant Women at Risk

Based on the data of reference types for pregnant women at risk, there are 206 pregnant women with Early Referral Planning (ERP), 18 pregnant women with Timely Reference (TR). Pregnant women at risk with ERP most at health center Simpang Rimba at 43.6% and pregnant women at risk with TR at 44.4% at health center Simpang Rimba.

Table 3. Data Types of Referral to Risky Pregnant Women in South Bangka Region

No	Name of Community Health Centers	ERP	TR
1	Toboali	23	2
2	Simpang Rimba	90	8
3	Rias	6	1
4	Pongok	0	0
5	Air Gegas	0	0
6	Air Bara	14	2
7	Tanjung Labu	29	2
8	Tiram	0	0
9	Payung	44	3
10	Batu Betumpang	0	0
TOTAL		206	18

Analysis Usability based on the questionnaire

The pre-test and post-test data were conducted on the same 32 respondents. A pre-test to measure the use of manual recording and reporting used at the health center while the post-test data to measure the use of recording and reporting applications. Data are presented as mean \pm SEM. Furthermore, the data distribution testing was performed with *Shapiro-Wilk* using SPSS 24.0. Both pre-test and post-test data were not normally distributed ($p < 0.05$).

Table 4. Recap of the value of Usability Application-based Reporting Recording (Post-Test)

No	Question	Value percentage	Information
1	Manual recording and reporting (MRR) helps effectively record and reporting activities	78,1 %	S
2	MRR helps midwives become more productive	78,1 %	S
3	MRR is very useful	65,6 %	S
4	MRR can make midwives more in control	71,9 %	S
5	MRR can make the midwife's things to do easier	75%	S
6	MRR can save time in recording and reporting	68,8 %	S
7	MRR according to recording and reporting needs	68,8 %	S
8	MRR is in line with the midwife's expectations	75%	S
9	MRR are easy to use	71,9 %	S

Cont... Table 4. Recap of the value of Usability Application-based Reporting Recording (Post-Test)

10	Simple MRR is used	81,3 %	S
11	User-friendly MRR	71,9 %	S
12	MRR only requires very few steps to complete recording and reporting	71,9%	S
13	MRR are easily adjusted	71,9%	S
14	MRR can be done without difficulty	75%	S
15	MRR can be used without written usage instructions	68,8 %	S
16	MRR, both fixed and occasional, will like this manual recording and reporting	75%	S
17	Midwives can fix errors quickly and easily	78,1%	S
18	Midwife successfully uses the application whenever opening it	75%	S
19	Midwives can quickly learn to use the application	75%	S
20	Midwives can easily remember how to use the application	75 %	S
21	The application is easy to learn how to use	71,9 %	S
22	Midwives are quickly involved in using the recording and reporting application	71,9%	S
23	Midwife satisfied with the application	68,8%	S
24	Midwives will recommend applications to their peers	68,8%	S
25	Interesting application to use	68,8%	S
26	The application works following what the midwife wants as a recording and reporting application	71,9%	S
27	This application is good	71,9%	S
28	Midwives feel the need for this recording and reporting application	71,9%	S
29	Midwives feel the need for this recording and reporting application	71,9%	S
30	Fun application when used	65,6%	S

Bivariate Research Results Application and Manual

The application utilization and manual recording can also be divided based on four criteria, namely usability, ease of use, ease of study and satisfaction. The difference between the four criteria in each of them is manual, and the application can be seen in Fig. 1.

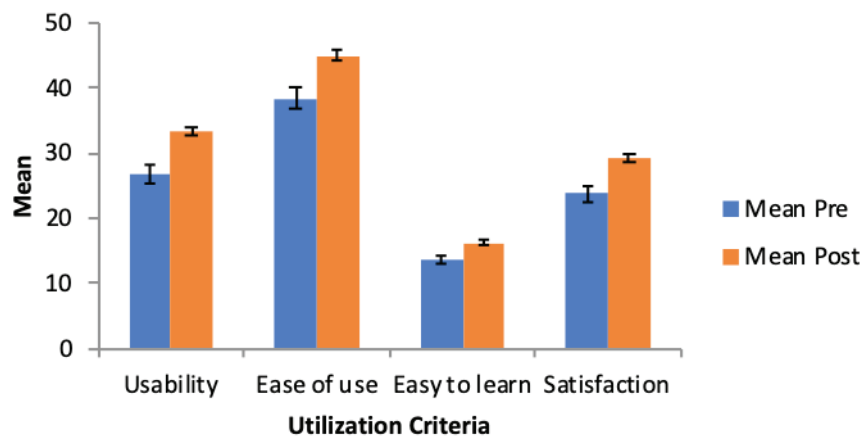


Figure 1. Analysis of the difference criteria for utilization of recording manual reporting compared to application.

Discussion

Data on Pregnant Women in South Bangka Regency

Based on the map of the distribution of high-risk pregnant women screening in the South Bangka Regency and Table 1, it can be seen that all pregnant women in the area in South Bangka Regency have been cleared using the application. Although there are still several of the community health centers that are still not maximally screening pregnant women, this is due to the difficulty of internet signals in several puskesmas in South Bangka. It is in line with research conducted by the *National Research Council (US) Committee*¹³, which states that many health recording and reporting processes are highly dependent on the internet network.

Data on Screening of Pregnant Women in the South Bangka Region

Based on Table 3, it can be seen that all pregnant women have been screened by Puskesmas midwives, which can be seen grouping pregnant women according to the Risk category. For low risk, there are 83 pregnant women, 62 high-risk pregnant women, and a very high risk of 18 pregnant women. It is in line with Poedji Rochyati's theory of a risk approach or Risk Approach Surgery strategy.

Some of these risk factors can be identified and measured so that we can use them in efforts to preventive health services⁹. So, the so-called risk approach strategy starts with the discovery of these indicators, then uses

them as a guide for further action. This understanding means that no one is free from risk. The hypothesis of a risk approach strategy is the more accurate the risk calculation is, the easier it is to understand the needs needed and the better (effective) the results⁹. Using risk factors or "scores" will make it easier for health workers to reduce delays in terms of early detection and referral.

Membership in Health Insurance

Based on data available in the SIDILAN application, 64.2% of pregnant women have not registered in health insurance membership (BPJS). It indicates the need for advocacy to people to have BPJS immediately, since it is very much needed in the referral process. One of the factors that cause mothers do not want to be referred to because it costs.

Types of Referrals

Based on data Table 3, types of referrals to pregnant women divided into two groups, namely ERP and TR. The SIDILAN application can support effective referral activities. While TR is done in GDO cases (obstetric emergency services) and requires a services emergency⁹. Based on univariate results, it is obtained that the data on the residence of pregnant women are more in the mainland. The application SIDILAN has included the distance and travel time required by the patient. It is expected that the mapping of mileage and time of travel will minimize the occurrence of delays in the referral process. The better the geographical conditions, the easier it will be to access referrals. Several studies have

used a distance of 5 km to determine whether pregnant women in rural areas are easier to get to health facilities than if the mother is within a distance of more than five kilometers¹⁴.

Bivariate Research Results of Application and Manual Utilization

The system (SIDILAN) shows an increase in utilization compared to the records carried out manually and considered more comfortable to use and applied in general, and this application can quickly detect pregnant women at risk who need to get immediate referrals to facilitate health workers/midwives, in particular, to prevent maternal and neonatal emergencies in their work area. Test results conducted in general show a significant difference between early detection of high risk, manual reference systems in the islands (103) with $p < 0.001$ ($p < 0.05$). Consecutively, the mean usability of the application is higher than the manual.

Conclusion

The research results conclude that the results of the design of high-risk early detection applications, the application-based archipelago maternal referral system (SIDILAN) has higher benefits compared to the manual-based ones.

Acknowledgment: The authors sincerely thank the Head of Health Service of Bangka Belitung Islands, the Head of Health Service of South Bangka, midwives who are willing to be respondents, Director of Health Polytechnic of Pangkalpinang, and the Head of Midwifery Department, Health Polytechnic of Pangkalpinang.

Conflict of Interest: The authors stated that they have no conflict of interest.

Source of Funding: The author received funding from Research on the Development of Health Workers, Health Polytechnic of Pangkalpinang.

Ethical Clearance: Ethical feasibility permit issued by KEPK, Health Polytechnic of Pangkalpinang No. 07/EC/KEPK-PKP/IV/2019.

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Knowledge and Awareness Regarding Bruxism and its Management in Dakshina Kannada Population

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Abstract

Bruxism is defined as a ‘repetitive jaw-muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible’ with ‘two distinct circadian manifestations; either occurring during sleep (sleep bruxism) or during wakefulness (awake bruxism).’ Bruxism may lead to masticatory muscle hypertrophy, tooth surface loss, fracture of restorations or teeth, hypersensitive or painful teeth and loss of periodontal support. A sample of 100 patients were selected for a questionnaire study to assess the knowledge and awareness regarding bruxism and its management. The results showed that there was an overall lack of awareness in the population. Knowledge and awareness should thus be provided to the population to ascertain early treatment and less discomfort to the patients having signs and symptoms of bruxism.

Keywords: bruxism, knowledge and awareness, bruxism management.

Introduction

Bruxism was adopted from ‘La bruxomanie’, and is used to describe gnashing and grinding of the teeth occurring without a functional purpose.¹ According to Glossary of Prosthodontics, bruxism is an oral habit consisting of involuntary rhythmic or spasmodic non-functional gnashing, grinding, or clenching of teeth, in other than chewing movements of the mandible, which may lead to occlusal trauma. It can occur during wakefulness, known as diurnal bruxism or in sleep; known as nocturnal or sleep bruxism.²

Various research studies have found that prevalence of bruxism ranges from 5-20% in adult population. Most of the subjects are unaware of them being affected by this disorder. It is usually first recognised by the Dentist, as most subjects are unaware regarding its signs and symptoms. Presence of tooth wear, fractured restorations/ teeth, pain in the masticatory muscles or pain in the temporomandibular joint may be signs seen by the dentist. At times, patient may also consult a physician for episodes of atypical jaw pain or headache.

In literature, there are various etiologic factors which have been reported for bruxism. These include peripheral factors such as tooth interference in dental occlusion; psychosocial influences such as stress or anxiety; central causes involving brain neurotransmitters or basal ganglia.³

Materials and Method

Study sample consist of 100 patients selected from the OPD of Department of Prosthodontics. A self-explanatory questionnaire was given to the subjects to collect the data. Prior to data collection informed consent

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was taken from all the subjects. Of 100 questionnaires distributed, all 100 were received back, and were considered valid for the study.

Results:

The questionnaires analysed 100 patients. The following conclusions were made from the answers provided.

63% have heard about clenching/bruxism and most of them heard it from their relatives(71.4%) & dentists(22.9%)

11% of the patient clenched their teeth,62% dint clench and 27% weren't aware if they clenched their teeth. Nevertheless, 17% had morning soreness in the jaw . 22% had headache in the morning .

91% of the patients weren't aware if they were clenching during the day.

The following figures show other results concluded from the answers.

7. Do you know the causes/factors responsible for Bruxism?
100 responses

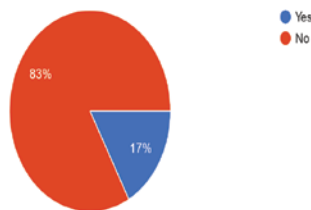


Figure 1: Knowledge about the causes of bruxism.

If yes, then which factors do you think is/are responsible?
17 responses

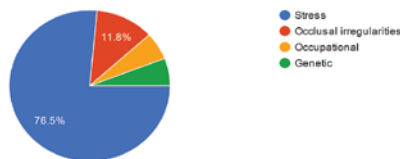


Figure 2: Factors responsible for bruxism according to responders

If yes, then what are the effects of grinding of teeth?
15 responses

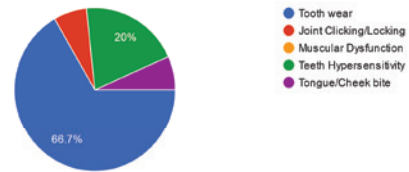


Figure 3: Effects of bruxism according to responders

Even though the patients dint know about the various treatment plans availbale most of them knew that they should seek treatment and should consult a dentist for treatment.

Around 6% sought treatment and had a successful outcome based on their response.

Discussion

Bruxism is characterised by clenching or grinding of the teeth due to contraction of the masseter, temporalis and other jaw muscles. Bruxism may lead to masticatory muscle hypertrophy, tooth surface loss, fracture of restorations or teeth, hypersensitive or painful teeth and loss of periodontal support. Sleep bruxism has previously been viewed as a dysfunctional movement or pathological condition, whereas it is now accepted as a centrally controlled condition with various systemic risk factors.⁴

The excessive forces on the teeth can contribute to alveolar bone resorption, which may be visible radiographically as generalised widening of the periodontal ligament space, and increased mobility which may be transient or permanent

A diagnosis of sleep bruxism may be made via patient report and clinical interview, clinical examination, intraoral appliances or recording of muscle activity. This epidemiological study was conducted on 100 subjects to assess knowledge and awareness regarding bruxism and its management among Dakshina Kannada population.

When asked the subjects if they have heard the terms teeth grinding/ clenching/ bruxism, out of 100 subjects only 37 subjects responded yes which depicts that majority of the population is not even aware of these terms.

Out of the 37% subjects, it was found that the majority, i.e, 71% have heard it from a relative while only 22% have heard it from a dentist.

To assess if the subjects knew the causes and factors or effects of Bruxism, it was found that 83% and 85% subjects were not aware regarding the above, respectively.

Management for bruxism is only indicated where problems arise causing patient various difficulties. Oral appliances primarily aim to protect the dentition from damage caused by clenching/grinding, although they may reduce muscle activity. Irreversible occlusal adjustments have no evidence in the management of bruxism. Behavioural strategies include biofeedback, relaxation and improvement of sleep hygiene. Administration of botulinum toxin (Botox) to the masticatory muscles appears to reduce the frequency of bruxism, but concerns have been raised regarding possible adverse effects.⁵

To assess the awareness among the subjects regarding the need for treatment of bruxism, out of 100 subjects, 66% subjects knew that bruxism requires treatment. While 95% subjects were unaware regarding the various treatment options of bruxism.

It was also observed that if patients suffered from any aforementioned symptoms, 81% preferred consulting a physician in comparison to a dentist.

This causes the delay in identification of signs and symptoms of bruxism and thus further delay in the treatment also.

According to this study it was observed that there was overall lack of knowledge and awareness among the population regarding bruxism and its management in the considered population. It is essential for both, the patients and the dentists to be aware of the potential aetiology, pathophysiology and management strategies

of sleep bruxism. Also, to ascertain the treatment at the earliest it is crucial to make the population aware. This can be done by conducting various local awareness programs which may help people to understand bruxism and its associated problems. With the aid of print and digital media, this knowledge and awareness can also be spread to a larger population.

Conclusion

Based on the results of the above study it was observed that there is lack of knowledge and awareness among the Dakshin Kannada population regarding Bruxism and its management. It should be ensured that the population is made aware of the various causes and factors and management strategies of Bruxism via a suitable aid.

Conflicts of Interests: Nil

Source of Fund: self

Ethical Clearance: taken from institutional committee

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Empowerment of Family Planning (FP) Cadres and Influencing Factors with SEM Analysis

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Abstract

Objective: This study aims to examine the factors that influence empowerment of family planning cadres.

Method: The study design was observational correlational type, with a survey approach. The number of research samples is 220 people, taken based on proportional cluster random sampling. Data analysis techniques using SEM analysis.

Results:(1) Program policies significantly influence cross-sectoral commitment and support with $p = 0.000 < 0.05$; (2) Cross sectoral commitment and support has a significant effect on satisfaction with $p = 0.004 < 0.05$; (3) Program policies have a significant effect on satisfaction with $p = 0.000 < 0.05$; (4) The satisfaction has a significant effect on the empowerment of FP cadres with $p = 0.000 < 0.05$; (5) Program policies do not significantly influence the empowerment of FP cadres with $p = 0.957 > 0.05$; (6) Commitment and cross-sectoral support does not significantly influence the empowerment of FP cadres with $p = 0.774 > 0.05$.

Conclusion: (1) Policy planning programs direct and significant impact on cross-cutting commitments; (2) FP program policies have a direct and significant effect on FP cadre satisfaction; (3) FP program policies do not directly influence the empowerment of FP cadres; (4) Cross-sectoral commitments and support directly and significantly influence the satisfaction of FP cadres; (5) Cross-sectoral commitments and support do not directly influence the empowerment of FP cadres; (6) Cadre satisfaction directly and significantly influences the empowerment of FP cadres.

Keywords: Program policies; Cross-sectoral commitments and support; Satisfaction cadre; Empowerment of Family Planning cadre.

Introduction

The problems faced by Indonesia are a large population increase and low quality of life. The

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total population of Indonesia in 2015 was 255.18 million people with an area of 1,910,931.32 km², a population density of 134 inhabitants / km². In the last five years (2010-2015) Indonesia's population growth rate was 1.43 percent. Indonesia's population continues to increase. In a period of fifteen years (2000 to 2015), the population of Indonesia experienced an increase of around 50.06 million people or an average of 3.33 million annually.² The high rate of population growth has an impact on the provision of food, non-food consumption materials, agricultural land, residential land, employment, education, community health level, and quality of life of the people.²

Indonesia is included in the category of a slow country in achieving the MDGs (Millennium Development Goals) which are now continued by Sustainable Development Goals (SDGs). This achievement is due to the high maternal mortality rate (MMR). MMR in 2012 reached 359 / 100,000 live births, and in 2015 there were 305 / 100,000 live births.²

Specifically, in Klaten Regency, the acceptors of family planning acceptors spread in 34 sub-districts are as follows: Couples of Childbearing Age (CCA) unmet need 10.13%, CCA is not FP participant 21.29% of the total PUS 201,950. There were 158,943 active participants (78.70%) acceptors of active family planning. Active FP participants at the beginning of the year were 142,048 (70.39%) acceptors, additional active FP participants were 16,895 (8.37%) acceptors. New participants were 26,481 (13.11%) acceptors and Drop Out participants were 9,586 (4.75% acceptors), meaning that the number of active family planning acceptors was still low, requiring an inspirational awareness to take part in family planning programs to increase the level of family welfare manifested in Family Norms. Small prosperous (now: quality family).³

The role of family planning cadres spread in each village greatly determines the success of the family planning program. FP cadres are very effective motivators and recruiters of family planning acceptors. FP cadres are members of the community who work voluntarily in the success of the family planning program. The role of family planning cadres includes promoting family planning programs, inviting, motivating, recruiting couples of childbearing age to become active FP participants. In this regard, it is necessary to empower family planning cadres to increase their role in the family planning program.

Some factors that influence the empowerment of FP cadres, namely: (1) External factors include: training, leadership, type of work, work design, reward system, resources (facilities), organizational climate (environment); (2) internal factors include: level of education, knowledge, personality, attitude, perception, background, experience (years of work), age, motivation, job satisfaction, organizational commitment.⁵

Considering that various factors can influence the empowerment of FP cadre, this research only focuses on program policy factors, cross-sectoral commitment and support, and cadre satisfaction. Based on the above can be formulated by the problem 's research, how namely model of the relationship between the policy of family planning programs, commitment and support cross-sectoral, and a cadre of satisfaction with the empowerment of the family planning cadre?

Materials and Method

The study design was a correlational type observational analytic with a survey approach. This research was conducted in the Klaten Regency area in 2019. The population of the research is in the area of family planning cadres in district: Prambanan, Manisrenggo, Karangnongko. South Klaten, North Klaten, Jatinom, Kebonarum, Kemalang, Tulung, Karangnom, Bayat, Delanggu, Juwiring, and Ceper. Total population of 401 cadres. The number of research samples is 220 FP cadres. The sampling technique uses proportional cluster random sampling. Data analysis techniques using SEM analysis.

Instruments research be my questionnaire compiled based on constructs, variables, and indicators that have been set. The questionnaire was also tested for validity and reliability before being used to collect data.

Result

Feasibility Model Intervariable Relations

Relationship model has met the feasibility of this model, because the value AGFI = 0.819 and GFI = 0.876, both included the marginal fit category. Then the value of TLI = 0.91 and RMSEA = 0.079, both included in the good fit category.

The significance of the relationship between variables can be seen from the values of CR and P as shown in table 1 below.

Table1. Significance of Intervariable Relations

Model			Estimate	SE	CR	P.
COMMITMENT	<---	POLICY	0.675	0.066	10.241	***
SATISFACTION	<---	COMMITMENT	0.292	0.101	2.893	0.004
SATISFACTION	<---	POLICY	0.330	0.089	3.716	***
EMPOWERMENT	<---	SATISFACTION	0.692	0.081	8.514	***
EMPOWERMENT	<---	POLICY	-0.004	0.067	-0.054	0.957
EMPOWERMENT	<---	COMMITMENT	-0.022	0.075	-0.288	0.774

Table 1 shows that: (1) Program policies significantly influence cross-sectoral commitment and support with a value of $p = 0.000 < 0.05$; (2) Cross sectoral commitment and support has a significant effect on cadre satisfaction with a value of $p = 0.004 < 0.05$; (3) Program policies have a significant effect on cadre satisfaction with $p = 0.000 < 0.05$; (4) The satisfaction of cadres has a significant effect on the empowerment of FP cadres with a value of $p = 0.000 < 0.05$; (5) Program policies do not significantly influence the empowerment of FP cadres with a value of $p = 0.957 > 0.05$; (6) Commitment and cross-

sectoral support does not significantly influence the empowerment of FP cadres with a value of $p = 0.774 > 0.05$.

Direct Influence, Indirect Influence, and Total Influence

To determine the influence of direct, indirect influence, and influence between variable total research can be seen from the output of Standardized Direct Effects, Standardized Indirect Effects, and Standardized Total Effects, such as in Table 2 to 4 in below.

Table 2. Standardized Direct Effects

Influence	Policy	Commitment	Satisfaction	Empowerment
COMMITMENT	0.713	0.000	0.000	0.000
SATISFACTION	0.382	0.320	0.000	0.000
EMPOWERMENT	-0.005	-0.029	0.857	0.000

Table 3. Standardized Indirect Effects

Influence	Policy	Commitment	Satisfaction	Empowerment
COMMITMENT	0.000	0.000	0.000	0.000
SATISFACTION	0.228	0.000	0.000	0.000
EMPOWERMENT	0.502	0.274	0.000	0.000

Table 4. Standardized Total Effects

INFLUENCE	POLICY	COMMITMENT	SATISFACTION	EMPOWERMENT
COMMITMENT	0.713	0.000	0.000	0.000
SATISFACTION	0.610	0.320	0.000	0.000
EMPOWERMENT	0.497	0.245	0.857	0.000

In tables 2 to 4 above it is known that: (1) FP program policies directly influence cross-sectoral commitment and support with a path coefficient of 0.731; (2) Policy planning programs directly affect the satisfaction of cadres with path coefficient of 0.382, and the indirect effect (through commitment and support cross-sectoral) to the satisfaction of cadres of 0.228. The total effect of family planning program policies on the empowerment of family planning cadres is $0.382 + 0.228 = 0.610$; (3) FP program policies directly influence the empowerment of FP cadres with a path coefficient of -0.005, and the indirect effect (through cadre satisfaction) on FP cadres empowerment of 0.502. The total effect of family planning program policies on FP cadre empowerment is $-0.005 + 0.502 =$

0.497; (4) Cross-sectoral commitment has a direct effect on cadre satisfaction with a path coefficient of 0.320; (5) Cross-sectoral commitment directly influences the empowerment of FP cadres with a path coefficient of -0.029, and the indirect effect (through cadre satisfaction) on the empowerment of FP cadres by 0.274. The influence of total cross-sectoral commitments on the empowerment of FP cadres is $-0.029 + 0.274 = 0.245$; (6) Cadre satisfaction directly affects the empowerment of FP cadres with a path coefficient of 0.857.

Based on the results of the above analysis, then the model of the relationship between variables that can be declared significant can be illustrated as shown in Figure 2 below.

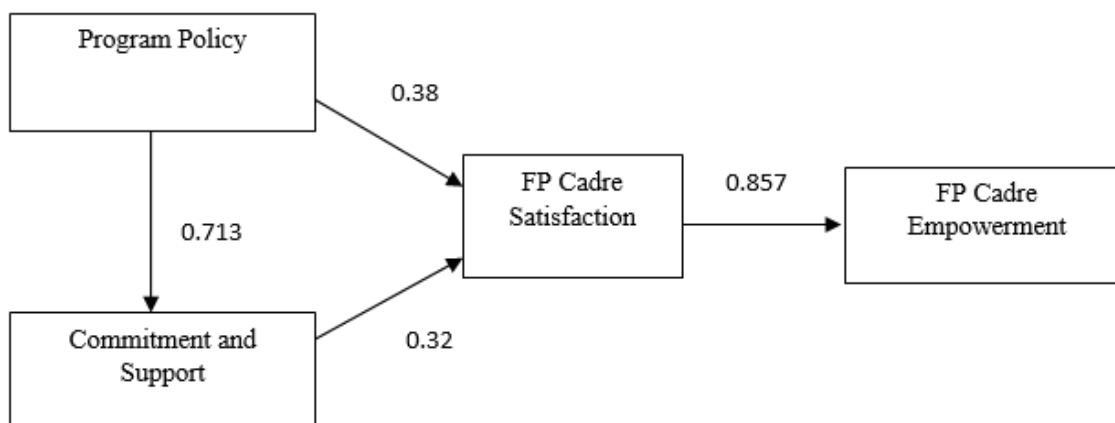


Figure 2: Relationship Model between Program Policies, Cross-Sectoral Commitment and Support, FP Cadre Satisfaction, and FP Cadre Empowerment

Discussion

Relationship of FP Program Policies, Commitment, and Cross-Sectoral Support, and FP Cadre Satisfaction

Family planning program policies have a direct and significant effect on cross-sectoral commitment and support. The results of this study support the results of research by Muslikh and Nugraha¹¹; Asnani, Mattalatta, and Gunawan¹ who concluded that the effectiveness of the Performance of Village Family Planning Assistance (PVFPA) performance was largely determined by indicators of the work environment and the efforts made. The work environment indicators are related to policies made by the government. Research Mailisa, Hendri, and Fauzan¹² concluded that the organizational climate positive and significant effect on performance, a positive value means the conducive organizational climate, it is expected to upgrade also performance.

Cross-sectoral commitment and support have a direct and significant effect on the satisfaction of FP cadres. Existence commitment and support cross-sectoral will increase the satisfaction of cadres FP so that with the commitment and support of cross-sectoral, cadres FP will strive in earnest to complete a given task. The results of this study support the results of research conducted by Suarjana, Putra and Susilawati¹⁵; Wirmayanis¹⁷; Permatasari, Swasto, and Iqbal¹² which concluded that organizational commitment has a positive effect on one's performance. The results of this support the theory Siagian¹⁴ which states that the commitment of the organization is one of the factors that determine the high lows performance of a person.

Relationship of FP Program Policy, FP Cadre Satisfaction, and FP Cadre Empowerment

PF program policies have a direct and significant effect on the satisfaction of FP cadres. This indicates that the relationship between government policies and cadre satisfaction is close because government policies related to family planning programs will affect the satisfaction of health cadres. Research Khamis and Njau⁶ conclude that health care workers' Mentioned extrinsic as well as intrinsic factors, which may influence the quality of health care services. Extrinsic factors included poor physical infrastructure, unavailability of medical equipment and/

or essential drugs and poor staffing levels.

Besides relating to the situation and conditions, government policies can also be related to intensive. Research by Muslikh and Nugraha¹¹; Asnani, Mattalatta, and Gunawan¹ concluded that the effectiveness of PVFPA performance was largely determined by indicators of the work environment and the efforts made. Work environment indicators are related to policies made by the government, one of which is intensive.

Therefore, according to Ife and Tesoriero⁴ government policy must use a community-based humanitarian service approach. The essence of the community-based humanitarian service approach is that the community must be responsible not only for providing services, but also for identifying needs, planning services for those who need them, setting priorities within the scope and among services that are "competing", and monitor and evaluate programs.

While the relationship between cadre satisfaction with cadre empowerment is closed because someone who feels satisfied at work will show high morale and show his ability to work. He will make every effort to carry out his duties as well as possible. Research by Novita, Sunuharjo, and Ruhana⁸ concluded that satisfaction influences performance (empowerment).

An FP cadre can feel satisfaction as an FP cadre if he feels satisfaction in terms of (a) Relationships with colleagues; (b) Relations with leaders; (c) The ability and efficiency of department heads; (d) Working hours; (e) Opportunity for initiative; (f) Promotional opportunities; (g) Salary or income; (h) Job security; (i) Work being handled; (j) Other job satisfaction (Ward and Sloane 2011, in Koesmono).⁷

Relationship of Cross-Sectoral Commitment and Support, FP Cadre Satisfaction and FP Cadre Empowerment

Cross-sectoral commitment and support direct and significant impact on the to cadres PF satisfaction. This indicates that the relationship between commitment and cross-sectoral support and cadre satisfaction is very close because, with the commitment and support from cross-sectoral, the cadre will make every effort to complete the

assigned tasks. Research conducted by Suarjana, Putra, and Susilawati¹⁵; Wirmayanis¹⁷; Permatasari, Swasto, and Iqbal¹² show that organizational commitment has a positive effect on one's performance. The results of this supports the theory Siagian²³ which states that the commitment of the organization is one of the factors that determinethe high lows performance of a person.

While the relationship of cadre satisfaction with cadre empowerment is also very close as explained above. Robbins¹³ mentions job satisfaction is a general attitude towards one's work as the difference between the number of rewards a person receives and the amount of rewards believed to be received. Luthans⁹ states that job satisfaction has three dimensions. First, job satisfaction cannot be seen, but can only be suspected. Second, job satisfaction is often determined by the extent to which work results meet or exceed someone's expectations. Third, job satisfaction reflects the relationship with various other attitudes of individuals. Koesmono⁷ job satisfaction is a positive or pleasant emotional statement as a result of an assessment of one's work or work experience. The statement implies that job satisfaction is a positive or pleasant emotional state that results from an assessment of one's work or work experiences.

Conclusion

Based on the results of research can be concluded: (1) Policy of family planning programs direct effect and significant to the cross-sectoral commitments and support; (2) FP program policies have a direct effect and significant on FP cadre satisfaction; (3) FP program policies do not directly influence the empowerment of FP cadres; (4) Cross-sectoral commitments and support directly and significantly influence the satisfaction of FP cadres; (5) Cross-sectoral commitments and support do not directly influence the empowerment of FP cadres; (6) Cadre satisfaction directly and significantly influences the empowerment of FP cadres.

Ethical Clearance : Take from the Research Ethics Committe of the Postgraduate Program, University of Sebelas Maret Surakarta, Indonesia.

Source of Funding: Self

Conflict of Interest : Nil

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A Study on Prevalence of Metabolic Syndrome in Young Medicos of South Karnataka

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Abstract

Background: It has been calculated that Non Communicable Diseases cause 68% mortality across the world, but mostly in low and middle income countries. Southeast Asia has seen growing NCD deaths since 2000. 60% of total deaths in India in 2012 were attributed to NCDs. International Diabetic Federation (IDF) consisting of experts from various countries and organizations has adopted a definition of Metabolic Syndrome (MetS) which is an aggregation of fatal heart attack risk factors, diabetes and pre-diabetes, abdominal obesity, high cholesterol and high blood pressure. **Objectives:** To assess the prevalence of Metabolic Syndrome in medical students and determine the behavioral risk factors associated with it. **Material and Method:** A cross sectional study was conducted on sample of 110 randomly selected medical students of second-year MBBS. Sample size calculated keeping the prevalence of metabolic syndrome 21% with precision of 10% and confidence level of 99%. Data was processed using latest SPSS version. Descriptive statistics, chi square, odds ratio and logistic regression were used for statistical analysis. **Results:** Out of 110 medical students 54 (49.09%) were males and 56 (50.91%) were females. Based on IDF criteria, only 10 (9.09%) had Metabolic Syndrome. The prevalence of individual parameters for Metabolic Syndrome were abdominal obesity (100%), low HDL (60%), High TG 80%, High FBS 50% and raised Blood Pressure 20%. Low intake of fruits was found in 90% and high sugar intake was found among 70% and low level of physical activity was reported in 80% students. Overall risk factors were found in 66% cases. **Conclusions:** This study concludes that prevalence of metabolic syndrome was 9.09% among young medicos. The prevalence of individual components for metabolic syndrome highest was TG 80%, followed by low HDL then high FBS 50% and raised Blood Pressure 20%. About 66% of young medico showed at least one risk factor for developing Metabolic Syndrome.

Keywords: Metabolic syndrome, prevalence, medicos.

Introduction

It has been calculated that Non Communicable Diseases cause 68% mortality across the world, but mostly in low and middle income countries¹. Southeast Asia has seen growing NCD deaths since 2000. 60% of total deaths in India in 2012 were attributed to NCDs². It has been estimated that 47% of the total out-of-

pocket expenditure is spent for managing NCDs³. In macroeconomic terms NCDs in India will cost 5%-10% of the GDP⁴. World Economic Forum and Harvard School of Public Health have estimated that over the next 20 years NCDs will cost more than US \$ 30 trillion i.e. 48% of global GDP in 2010 and force millions of people below poverty line⁵. A high level committee recently has set the goal of “25x25” - reducing the premature death due to major NCDs by 25% by year 2025⁶. The prediction models suggest that the reduction of six NCDs risk factors namely, tobacco use, alcohol use, high salt intake, obesity, high BP and glucose, can lead to achieving this target⁷. Metabolic Syndrome, a precursor of NCDs, is a global public-health challenge

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because of increasing sedentary lifestyle and excessive calorie-intake.

International Diabetic Federation (IDF) consisting of experts from various countries and organizations has adopted a definition of Metabolic Syndrome which is an aggregation of fatal heart attack risk factors, diabetes and pre-diabetes, abdominal obesity, high cholesterol and high blood pressure⁸. The people with Metabolic Syndrome have 2-3 times higher risk of CVDs and 3-5 times higher risk of Diabetes Mellitus compared to healthier individuals⁹. This syndrome is a rising threat to the young adult Indian population with prevalence from 11% to 41%. It is thought to be the primary driver behind the epidemic of Diabetes Mellitus and CVDs. The lowest prevalence in first-year medical students of North Karnataka was found 10.83%¹⁰ whereas highest prevalence, 40.9% was reported in Northern India¹¹. It was found that 30% of obesity starts with childhood¹² and roughly 50-80% of these obese children become obese adults¹³. Recently scientists have seen evidence that Vitamin D deficiency not only affects the skeletal system but also makes one prone to CVDs, Diabetes Mellitus, autoimmune diseases and cancer¹⁴.

A Comprehensive National Nutritional Survey conducted by Ministry of Health and Family Welfare found that almost one in 10 school children and adolescents were pre-diabetic and 1 percent were diabetic. 5% school-aged children and adolescents had hypertension. Report also mentioned growing incomes leading to increased spending on fried foods, junk foods, sweets and aerated drinks. Only 25% of the adolescents were found to have consumed green leafy vegetables once a week¹⁵.

World Health Assembly endorsed the global plan for prevention and control of NCDs 2013-2020. A holistic approach by the governments with public and private sector participation is the key to meet the main objectives of a 25% reduction in NCD-mortality, 30% reduction in the mean population intake of salt & tobacco in people over 15 years, reduction of 10% in the prevalence of physical-inactivity and alcohol-consumption¹⁶.

The IDF has defined Metabolic Syndrome as the presence of central obesity (waist circumference > 90 cm for men and >80 cm for women) along with any two of the four criteria below:

1. Fasting blood sugar ≥ 100 mg/dl
2. Triglycerides ≥ 150 mg/dl
3. High Density Lipoprotein < 40 mg/dl in males and < 50 mg/dl in females
4. Systolic Blood Pressure ≥ 130 mm Hg and diastolic BP ≥ 85 mm of Hg

The detection of Metabolic Syndrome at early age and follow-up intervention is the only way to prevent and minimize its progression. Hardly any study has been conducted in young population in this area. The present study has two main research questions: First to update on changing patterns of Metabolic Syndrome in this region; second to quantify factors significantly contributing to it.

Objectives

1. To assess the prevalence of metabolic syndrome in medical students.
2. To determine the behavioral risk factors associated with Metabolic Syndrome.
3. To assess the dietary habits and physical activities of the study subjects.

Material and Method

A cross sectional study was conducted from Sep to Dec 2019 on sample of 110 randomly selected medical students with age ranging from 18 to 22 of second-year MBBS. The study has been approved by Institutional Ethical Committee, SSMC. Sample size calculated keeping the prevalence of metabolic syndrome 21% with precision of 10% and confidence level of 99%.

So, $n = Z^2PQ/d^2$ where $P=21\%$, $Q=79\%$ ($100-21$), $d = 10$, $Z=2.58$ (99% CL)

$$n = 2.58^2 \times 21 \times 79 / 10 \times 10 = 110$$

A written informed consent from all the students involved in study was taken. Pre-tested proforma was filled by each student with details of demography, behavioral and dietary details history and physical activities. Waist circumference was measured using an inch tape immediately above the iliac crest, Blood Pressure was measured in right arm sitting position by electronic calibrated BP apparatus after 10 minutes rest

and repeated 3 times keeping 1 minute interval and average of all three readings was recorded. Blood investigation such as fasting blood sugar, triglyceride and high density lipoprotein were carried out as per instruction manual provided by the kit (ERBA-Diagnostic Germany) and FBG was estimated by glucose oxidase-peroxidase end point colorimetric method in hospital lab on the next day. Descriptive statistics, chi square, odds ratio and logistic regression were used for statistical analysis using latest SPSS 16th version.

Results

Out of 110 medical students 54 (49.09 %) were males and 56 (50.91%) were females. The mean age was 20 years. Based on IDF criteria only 10 (9.09%) had Metabolic Syndrome (MetS) and male were 6 (5.45%) and female were 4 (3.64%) but difference is not statistically significant. [Table-1]

Table 1 – Gender-wise Prevalence Rate

Gender-wise Prevalence Rate						
	Male		Female		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Total	54	49.09%	56	50.91%	110	100.00%
With MetS	6	5.45%	4	3.64%	10	9.09%

Chi-square with Yates correction-0.1537 and p value- 0.695036

The prevalence of individual parameters for Metabolic Syndrome were abdominal obesity 100%, low HDL 60%, High TG 80%, High FBS 50% and raised Blood Pressure 20%. Low intake of fruits was found in 90% and high sugar intake was found among 70% and low physical activity for 80% students. Overall risk factors were found to be at 66%. [Table-2].

Table 2- Clinical Profile of Metabolic Syndrome

Clinical Profile of Metabolic Syndrome							
	MetS	% MetS	No MetS	% No MetS	Total	X ²	p-Value
Waist Obesity	10	100%	20	20%	30	29.33	0.0000
High FBS	5	50%	8	8%	13	15.39	0.0001
High TG	8	80%	16	16%	24	21.83	0.0000
Low HDL	6	60%	28	28%	34	4.36	0.0368
High BP	2	20%	9	9%	11	1.22	0.2689
Low Fruit Intake	9	90%	71	71%	80	1.65	0.1983
Unhealthy Food	5	50%	9	9%	14	13.76	0.0002
High Sugar Intake	7	70%	21	21%	28	11.50	0.0007
Low Phy Activity	8	80%	47	47%	55	3.96	0.0466

Correlates of Metabolic Syndrome in univariate analysis are shown in [Table-3]. Students having high Triglycerides were 21 times more likely to have Metabolic Syndrome (MetS) and those having high Fasting Blood Sugar were 11 times likely to have Metabolic Syndrome. Similarly individuals with low HDL and high Blood Pressure were likely to have MetS about three times. Likewise there was more risk of Metabolic Syndrome among those who had low Fruits Intake and low Physical Activity as well as unhealthy food.

Table 3 - Correlates of Metabolic Syndrome

Correlates of Metabolic Syndrome					
	Risk Factor Present		Risk Factor Absent		Odds Ratio
	MetS	No MetS	MetS	No MetS	
Waist Obesity	10	20	0	80	NA
High FBS	5	8	5	92	11.50
High TG	8	16	2	84	21.00
Low HDL	6	28	4	72	3.86
High BP	2	9	8	91	2.53
Low Fruit Intake	9	71	1	29	3.68
Unhealthy Food	5	9	5	91	10.11
High Sugar Intake	7	21	3	79	8.78
Low Phy Activity	8	47	2	53	4.51

Discussion

This cross sectional study was conducted for the first time among young medico of South Karnataka and lowest metabolic syndrome prevalence rate of 9.09% was found. The prevalence of Mets for male and female was 5.45% and 3.64% respectively but difference was not statistically significant. While in the first-year medical students of North Karnataka, the prevalence of MetS was found at 10.83%¹⁰. The prevalence of Metabolic Syndrome was 22%, abdominal obesity was the commonest risk factor for the development of MetS in the studied group of medical students¹⁷. Forty percent of faculty members were overweight (BMI > 23) and another 40% were obese (BMI > 25)¹⁸. 21.7% prevalence of MetS was detected among apparently healthy workforce of Pakistan¹⁹. The prevalence of MetS has been seen highest in Mexican adults as 54.8%, reaching 73.8% in obese subjects²⁰ followed by USA at 30% and Japan 27.2%.

The prevalence of components of metabolic syndrome in our study in decreasing order was high TG-80%, low HDL-60%, high FBS-50%, high BP-20%. Low HDL was the first common component of MetS with mean prevalence of 62.9% seen in systemic review²¹, which is same as in our study but hypertriglyceridemia was third most prevalent (30.8%) component. Nine in ten Bengalureans lack HDL in the age group of 30-40 years.

Men in Chennai, Mumbai, Delhi and Pune reported to be 8 out of 10²². In this study 90% of students had low consumption of fruits; while in another study conducted by the author, 27.9 % of interns had consumed 400 gm of fruits and vegetables as recommended by WHO²³. The consumption of one serving of fruits was observed among 48.8% of participants while 10.5% consumed two serving in a day²⁴.

Latest study conducted by Selvaj K, Sekhar S et al in adults over 18 years living in urban field practice area of JIPMER Puducherry had shown clustering of NCDs risk-factors as high as 73%. Low intake of fruits and vegetables, high salt intake and large waist circumference were reported as major risk factors across all groups²⁵. We found that 70% of students consumed high amount of sugar. High intake of sugar is main culprit in development of diabetes and cardiovascular diseases followed by low intake of fruits and vegetables. India is the largest consumer of sugar 25.01 kg per person per year which is five times the WHO recommended threshold for sugar intake²⁶. Consumption of sugar per capita has increased from 22 gm/day in 2000 to 55.3 gm/day in a span of 10 years and total fat consumption increased from 22gm/day in 2000 to 54 gm/day over the same period while total salt consumption went up from 9 to 12 gm/day per-capita. A single can of sugar sweetened beverage contains up to 40 gm of sugar²⁷. Sievenpiper conducted 20 controlled feeding trials and

found that high doses of fructose, rather than glucose, may increase cholesterol, uric acid and postprandial triglyceride²⁸. Sugar intake associated with a healthy life should be at 5% of total energy intake. A message that free sugar consumption is causative for NCDs should be comprehensively conveyed through health warnings across media²⁹. We also observed that 80% of students had low level of physical activity and sedentary lifestyle was reported by nine studies to increase prevalence of MetS¹⁸. MetS is affected by genetic/epigenetic make up of individuals, predominant lack of physical activity and other factors like quality and composition of food and composition of the gut microbes³⁰.

Conclusion

Our study concludes that prevalence of metabolic syndrome was 9.09% among young medico with no statistical difference in genders. In prevalence of individual components for Metabolic Syndrome, TG was found to be highest (80%), followed by low HDL (60%), high FBS (50%) and the least by raised Blood Pressure (20%). About 66% of young medicos showed at least one risk factor for developing Metabolic Syndrome. Early detection and early prevention by eating healthy diet, regular physical activities and other lifestyle modifications may be very helpful for the young medicos to decrease risk of having Metabolic Syndrome and its various components. There is an urgent need to address these issues regarding NCDs with inclusion of nutritionist at clinics and at community-level.

Limitation: Small sample size, the results of which cannot be generalized.

Source of Funding: The study was conducted with financial support for laboratory and stationary expenses from Sri Siddhartha Academy of Higher Education.

Conflict of Interest: NIL

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A Study to Find Out the Effect of Dynamic Soft Tissue Mobilization (DSTM) with Retro - Walking on Hamstring Flexibility and Dynamic Balance in Young Collegiate Students – An Interventional Study

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Abstract

Background: Prevalence of hamstring muscle tightness among undergraduate students shows 40.17%. Hamstring muscle tightness is “inability to extend the knee completely when the hip is flexed accompanied by discomfort or pain along the posterior thigh and/or knee is usually attributed to. Dynamic soft tissue mobilization developed with the aim of increase muscle length. It utilizes combine technique classic massage followed by dynamic component with the limb is moved through its range. Retro – walking is a dynamic activity which can improve be used to treat the flexibility as well as dynamic balance. **Aim:** To find out the effect of dynamic soft tissue mobilization with retro - walking on hamstring flexibility and dynamic balance in young collegiate students. **Methodology:** 25 subjects were selected Based on the selection criterion, the whole procedure of the study was explained to all the subjects. Prior and after to treatment both the outcome measures, Active Knee Extension Test and Y - Balance Test were measured. Intervention in the form of Dynamic Soft Tissue Mobilization Technique with Retro – walking were given alternate 3 sessions per week for 4 weeks. **Results and Discussion:** The data were analysed by Paired t test. P value for both the outcome measures were <0.05 which shows significant improvement by improving flexibility and dynamic balance. **Conclusion:** Intervention of the study was effective, very simple and easy to apply in Hamstring tightness subjects. So it can be implemented clinically as well.

Key Words: *Dynamic Soft Tissue Mobilization (DSTM), Retro- Walking, Y - Test, Active Knee Extension Test, Manual therapy, Hamstring Flexibility*

Introduction

Prevalence of hamstring muscle tightness among undergraduate students shows 40.17% in which tightness has found more in male than female participants.¹ The hamstring muscles are commonly linked with movement dysfunction at the lower lumbar spine, pelvis and lower limbs, and have been coupled with low back pain and gait abnormality.²

The back of thigh Muscles are called as a hamstring muscle. This includes semitendinosus, semi-membranous, Long head biceps femoris and the ischial head of the adductor magnus.³

The biomechanically hamstring muscle is proved as a knee flexors. However, it is important to recognize that because these muscles attach on both the medial and lateral aspect of knee joint, pure knee flexion requires activity of both the medial and lateral muscle mass. Medial hamstring Contraction produce medial rotation with knee flexion and also lateral hamstring Contraction produce Lateral rotation with knee flexion.⁴

In addition to flexion and rotation of knee, hamstrings reportedly contribute to stability of knee. The hamstring provide resistance to anterior glide on tibia on femur. Thus, they are described as important adjunct to the anterior cruciate ligament and perhaps a

critical substitute in the ACL deficient knee. The most prominent period of activity is at the transition of swing and stance period of gait cycle.⁴

The Weakness of hamstring muscles causes loss of knee flexion. Weakness in knee flexion in the erect posture produces little disability. However, weakness of hamstring muscle also leads to affect functional impairments at hip, where hamstring muscle provides substantial part of extension strength. The flexion moment is resisted by an extension moment generated at least in part by the hamstring muscle. Weakness of hamstring may result in difficulty in lifting and bending.⁴

Hamstring muscle tightness is “inability to extend the knee completely when the hip is flexed accompanied by discomfort or pain along the posterior thigh and/or knee”.¹ Hamstring tightness commonly found in both symptomatic and asymptomatic subjects. The hamstring is a group of muscle that have tendency to shorten. Decrease hamstring flexibility leads to increase chances of hamstring injuries in athletes. Tightness of hamstring muscle result in limitation in knee extension ROM when hip is flexed. Tight hamstring causes increased patello femoral compressive force. This may lead to patello femoral syndrome. And also causes low back pain in young adult.⁴

Flexibility is considered as an essential element for normal biomechanical function. Tightness of hamstring lead to post- exercise soreness and decreases coordination among athletes.⁵ the literature reports few associated benefits of flexibility including improved athletic performance, reduced injury risk, prevention or reduction of post-exercise soreness, and improved coordination. Some studies have shown that decreased hamstring flexibility is a risk factor for the development of patellar tendinopathy and patellofemoral pain, hamstring strain injury and symptoms of muscle damage following eccentric exercise.⁶⁻⁹

Body balance consists of maintaining the centre of gravity within the base of support defined by the feet, and it may be static or dynamic.¹⁰ In static balance, the base of support remains fixed while the centre of gravity moves. In this case, the sense of balance maintains the centre of gravity within the base of support defined by the feet. Whereas, in dynamic balance, both the center of gravity and the base of support are in constant motion,

and the center of gravity never aligns itself to the base of support during the stance phase of the movement.¹

DSTM technique is developed with the aim of increase muscle length. It utilizes combine technique classic massage followed by dynamic component. Determine specific area of tightness, where the treatment is concentrated. And Retro – walking is a dynamic activity which can improve be used to treat the flexibility as well as dynamic balance.

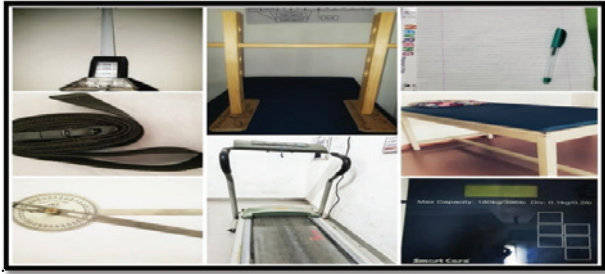
Many literature shows many benefits of hamstring flexibility including reduce injury risk and that’s why improved performance. Various techniques are available for soft tissue mobilization. Among them DSTM is also effectively improving flexibility individually. DSTM combine with Retro – walking may effective in improvement of flexibility and dynamic balance but lack of evidences are available. So, the Hypothesis of the study was that there was significant effect of DSTM with Retro – walking on hamstring flexibility and dynamic balance on young collegiate students.

Method

After approval from Institutional Ethical committee and CTRI registration process 25 subjects were selected Based on the inclusion and exclusion criteria. The whole procedure of the study was explained to all the subjects and written informed consent was taken. Prior and after to treatment both the outcome measures, Active Knee Extension Test and Y - Balance Test were measured. Intervention in the form of Dynamic Soft Tissue Mobilization Technique with Retro – walking were given alternate 3 sessions per week for 4 weeks.

- Consent Form
- Data Collection Form / Assessment Form
- Pen
- Paper
- Goniometer
- Active Knee Extension Frame
- Stabilizer belt
- Couch

- Treadmill
- White tape for Y-TEST
- Measure tap
- Weight machine
- Stadiometer



Materials used in study

Study Design: An Interventional Study.

Study Setting: RK University.

Sampling Technique: Purposive Sampling

Study Population: Young Collegiate Students

Study Sample: 25

Study Duration: 6 Months

Inclusion Criteria:

- Males and females of age between group 17 - 25 years
- Inability to achieve active knee extension above 160 degrees in active knee extension test.²⁴

Exclusion Criteria:

- Hamstring injury at least for the past 1-year.
- Any past traumatic and non-traumatic lower extremities of history
- Individual engaged with Sports activity
- Hyper mobility of the lower extremity joints²⁴

Intervention:

DSTM:

The Subject was positioned in prone and researcher

stand on same side of hamstring tightness and following the steps explained here.

Deep longitudinal strokes were applied to the entire hamstring muscle group to locate the specific area of hamstring muscle tightness. Once the specific area of was located, the remaining treatment was limited to this target area. After that the subject was positioned supine with the hip and knee flexed to 90 degrees. Deep longitudinal strokes were applied in a distal to proximal direction to the area of hamstring tightness when the leg was passively extended. Then the next progressive, dynamic technique was applied.

During this technique, the subject was required to actively extend their leg, to achieve reciprocal inhibition of the hamstrings. In this final procedure, the subject was instructed to contract the hamstring muscle group eccentrically against the resistance offered by the investigator's hand as the muscle is elongated up to the end range of motion.

During this movement, five deeps distal to proximal longitudinal strokes over the reduced hamstring area of muscle tightness are performed.¹²

Retro Walking:

In starting of retro walking on treadmill first subject opportunity to acclimate with backward walking on a treadmill by one supervise 10 min practice section at 0-degree inclination.

During intervention period the treadmill will adjust to produce a speed of 4 km/h and 0-degree inclination for 6-minute period of retro walking 3 times a week.²⁴

Result & Statistics

The present study was carried out to find out the effectiveness of Dynamic Soft Tissue Mobilization with Retro - walking On Hamstring Flexibility and Dynamic Balance in Young Collegiate Students. Data was analysed using SPSS software version 20 and Microsoft Excel 2016. Before applying statistical tests, data was screened for normal distribution. All the outcome measures were analysed before and after intervention.

Table: 1 INTRA GROUP ANALYSES FOR AKE TEST.

	Pre treatment		Post treatment		p value
	Mean	± SD	Mean	± SD	
RIGHT SIDE	113.60	5.50	134.2	6.72	0.000
LEFT SIDE	116.0	6.61	134.2	8.25	0.000

Here the intra group analysis for AKE test was done by using Paired T test. Where the p-value is <0.05. It is statistically significant and it shows improvement in hamstring flexibility after intervention.

Table 2: INTRA GROUP ANALYSES FOR Y TEST

	Pre treatment		Post treatment		p value
	Mean	± SD	Mean	± SD	
RIGHT SIDE	81.106	10.71	90.90	11.71	0.000
LEFT SIDE	80.24	11.43	89.33	11.68	0.000

Here the intra group analysis for Y- test was done by using Paired T test. Where the P- value is <0.05. It is statistically significant and it shows improvement in dynamic balance after intervention.

Discussion

The result of the present study demonstrated that hamstring flexibility and dynamic balance improved after intervention.

Dynamic soft tissue mobilization technique releases the scar tissue adhesions to allow full lengthening of the muscle and to regain flexibility for functional use. In the DSTM component, the hamstring muscle group receives progressive dynamic techniques that work in synchrony as the muscle moves to the end ROM. In last stage of technique the muscle works eccentrically at its functional length and hamstring flexibility is optimised. For DSTM, it is hypothesized that incorporating active contraction into a massage protocol may increase muscle perfusion and decrease muscle stiffness.¹⁵

During Retro - walking, the stance begins with toe contact and ends with heel being lifted off the ground the normal eccentric contractions of the rectus femoris is replaced by propulsive concentric contraction, during the

activity at 0 degrees of inclination the knee was flexed approximately 31 degrees during initial contact. By mid-stance, the knee had extended position of approximately 14 degrees of knee flexion. period, the rectus femoris is also contracting, presumably Concentrically to assist with knee extension during backward walking, at the ankle, backward walking produced greater demands on dorsiflexion range of motion.

Active knee extension test was found as the gold standard test for the measurement of hamstring flexibility with intra-tester reliability (ICC) of 0.94 in a study done by **D. Scott Davis** on concurrent validity of four clinical tests.^{16, 17} The Y Balance Test is a dynamic stability test, it considered efficient and clinically applicable to provide an accurate assessment of the lower limb neuromuscular control.²¹

Sachin maghade et al (2018)¹⁵ compared immediate effect of DSTM and Active release technique on hamstring tightness in young adults. Hamstring tightness was assessed by sit and reach test.

After the treatment session again assessed hamstring flexibility and it shows improvement in flexibility of hamstring muscle. Both the technique shows equal effect on hamstring flexibility. **Suraj bhusal (2013)**¹⁶ when compared the DSTM and Active release technique for hamstring muscle flexibility and measured the Flexibility by AKE test, concluded that DSTM was effective as compared to Active knee release in improving knee extension test. **D Hopper et al (2005)**⁵ conducted study to compare DSTM and Classical massage technique on hamstring muscle flexibility in hockey players. By Passive straight leg raises (PSLR) and Passive knee extension (PKE) were used to measure indirect hamstring length before, following and 24-hour post intervention. It was concluded that both classic massage and DSTM had an immediate, significant effect on hamstring length in competitive female field hockey players. This all literature supports the present study.

Adilah Logde (2018)¹² studied the effect of retro - walking on hamstring flexibility in normal healthy individual. And concluded that Training protocol for 4 weeks, showed significant improvement in the hamstring flexibility. **Sami S. Alabdulwaha et al (2018)**¹⁹ studied an analysis of physical performance between backward and forward walking training in young healthy individuals and it shows the Backward walking training has been proved to be effective in improving the lower limb functional strength, aerobic and anaerobic capacities of the normal healthy individuals.

According to **whitely et.al (2009)**, an increase in length of muscle could be the possible reason for increase in the dynamic balance. As well as **costa 2009** had reported that stretching duration of 15 seconds hold may improve balance performance by decreasing postural instability. Here, intervention was effective in improving the flexibility which is reflected in AKE score and Retro – walking. Hence these shows strong correlation between improvement in flexibility and dynamic balance.

Further Recommendation

- Study can be done in other population
- Study can be done to
- Compare male and female.

Conclusion

The result of the present study showed that subjects were improved after the study intervention by improving flexibility and dynamic balance. Hence, concluded that the DSTM with Retro – walking was very effective, simple and easy to apply in Hamstring tightness subjects. So it can be implemented clinically as well.

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Relationship between Perceived Stress and Coping among Caregivers of Patient with Schizophrenia

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Abstract

Background: Caring for a family member with a mental illness can be a strenuous and are responsible for day to day needs of the patient which is done meticulously with adequate supervision. The principal investigator intended to investigate the relationship between stress and coping among caregivers of patient with schizophrenia.

Materials and Method: A total of 75 caregivers were included in the study. The tools used for this study are Perceived Stress Scale (PSS) 14 items was developed by Cohen, S., Kamarck, T., & Mermelstein, R. (1983). and the coping checklist has 70 items developed by Rao, Subbhakrishna and Prabhu (1989). which cover a wide range of behavioral, cognitive and emotional responses that may used to handle stress.

Results: The study findings shows that there was a significant association between age and perceived stress and coping. Perceived stress had significant association with educational qualification, type of family and monthly family income. Coping had significant association with occupation, social support and relationship with the patient. This association is statistically highly significant at $p < 0.000$ level. The Study reveals a significant positive correlation between perceived stress and coping ($r = 0.529$).

Conclusion: The mental health care professionals to be actively involved in prevention of mental illness and promotion of mental health through the assessment of stress perceived by the caregivers of mentally ill in order to help them to be resilient and use more constructive coping strategies in stressful situations.

Keywords : *Perceived Stress, Coping, Caregivers, Schizophrenia*

Introduction

Mental illness is currently a major health issue worldwide, as it is increasingly found in the day-to-day life of the population and caregivers are generally vulnerable and unprepared to cope with the entire process of the illness and treatment². Schizophrenia is perhaps the most dramatic and tragic manifestation of mental illness known to mankind. The consequences of the

illness for the individual affected, his or her family, and society in general are distressing. In India, where about 1.1 billion people reside, the prevalence of schizophrenia is about 3/1000 individuals⁴. This illness places a huge burden not only on the individuals afflicted, but also the people closest to them, termed caregivers, who live with the individuals, interact with them regularly and lend a helping hand in their day to day activities. The impact of schizophrenia on families is often distressing and disruptive. The first signs in a family member appear as confusing changes in behavior. As a result of de-institutionalization and the increasing shift of psychiatric care to the community, the role of family caregivers has gained in importance. Today, after their relatively short stay at inpatient care, most schizophrenia patients are discharged to their homes in most cases this means back to their families¹⁰. Coping with stress is one of the

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biggest health concerns and its effect can be different from one person to another. Stress is primarily a process of motivation since it requires some sort of adaptation (coping) to the demand or set of demands. The effect of stress is directly linked to coping. Caregivers are using a wide variety of coping strategies in both aspects. It was problem-focused coping strategies and emotion-focused strategies. While taking care of mentally ill-patient, caregivers are facing overburden, stress, anxiety and depression⁴. So, they are trying to adopt the situation, even though trying also, they don't have that much adequate coping abilities.

On the one hand, this development represents an immense progress for the patient because natural social integration into the family and partnership cannot be replaced by any psychiatric care service—regardless of how good it may be. On the other hand, living with a schizophrenia patient can put considerable burdens and restrictions on the rest of the family⁵.

Caregivers may experience considerable amount of distress themselves and may have a poor quality of life (QOL) if they are unable to cope with the stress associated with the process of caregiving. Accordingly, it is important to evaluate and understand the coping strategies used by the caregivers of schizophrenia⁴. Caring a mentally ill at home is a burden upon the family in terms of time, energy and finance, caring for a schizophrenic relative can increase the likelihood that the caregiver is at risk to develop symptoms of physical and mental illness³. Stressors are coped with based on how significant they are for those involved. Coping means trying to overcome that which is causing stress, and may refocus the significance associated with the difficulties, guide the individual's life and keep him/her physically, psychologically and socially healthy⁶.

Based on the past studies at various places done a research on distress, coping and stigma these outcome variables found to be affected during the caregiving process there by the caregivers tend use different coping strategies to overcome the stress and other problems related to caregiving. Hence, this study aims to examine the correlation between stress and coping among caregivers of patients with schizophrenia.

Objectives

1. Assess the level of stress and coping among caregivers of patients with schizophrenia
2. Correlate stress and coping among caregivers of patients with schizophrenia
3. Associate the stress and coping with selected background variables of caregivers of patients with schizophrenia

Method and Material

A descriptive research design was adopted for this study conducted at psychiatric ward and Psychiatric Outpatient department of Sri Ramachandra Hospital, Porur. The good infra structure facilities available in the psychiatric ward and Psychiatric Outpatient department which enabled the investigator to meet the participants easily. 75 caregivers of patient with schizophrenia were recruited to participate in this study. The research was conducted using self-rated questionnaires. The study included were between the age group of 21-50 years, available during data collection, able to read and write in English and Tamil, willing to participate in this study, both male and female caregivers, not on special treatments like diabetes mellitus, hypertension and other disease and must have been with the patient for more than 6 months. Purposive sampling technique was used to select the samples for this study. Researcher began the recruitment process by obtaining the names and identification numbers of the caregiver who is staying in inpatient and caregiver who is visiting outpatient department. Written informed consent was obtained before the distribution of questionnaires. The participation was completely voluntary. Subjects were given the freedom to withdraw from the study at anytime. Confidentiality of the collected data was maintained. Subjects were also informed that they can withdraw from the study at any point of time. Each questionnaire consisted of three sections namely sociodemographic profiles, perceived stress scale and coping checklist. This research was approved by Institutional ethical committee of Sri Ramachandra institute of Higher Education and Research (DU) and permission was obtained from the principal college of nursing, the Head of the Department of Psychiatry of Sri Ramachandra Hospital to carry out the study.

Background variables :

This section included information about the caregivers: age, sex, religion, marital status, place of residence, educational qualification, occupation , duration of caregiving, and relationship with the patient, social support, medical expenses.

Perceived Stress Scale

Perceived Stress Scale (PSS) was developed by Cohen, S., Kamarck, T., & Mermelstein, R. (1983). The tool consists of 14 items (0 = Never; 1 = Almost Never; 2 = Sometimes; 3 = Fairly often; 4 = Very often) Scores 0–18 show that there is low stress, 19–37 moderate stress, 38–56 high perceived stress. The reliability of the scale is $r = .78$.

Coping Checklist (CCL)

The coping checklist developed by Rao, Subbhakrishna and Prabhu (1989). The tool comprises of 70 items, which cover a wide range of behavioral, cognitive and emotional responses that may used to handle stress. The items are scored dichotomously in a yes/ no format. One point is given to every ‘yes’ responses. It consists of seven subscales; one of problem focused coping (problem solving), five of emotion focused coping (positive distraction, negative distraction, acceptance/ redefinition, religion/ faith and denial/ blame) and one of problem and emotion focused coping (social support seeking).

- A) Problem focused coping: 1-10
- B) Emotion focused coping:
 - Ø Positive distraction: 11-20
 - Ø Negative distraction: 21-28
 - Ø Acceptance and redefinition: 29-37

- Ø Religion/ faith: 38-45
- Ø Denial/ blame: 46-55
- C) Problem and emotion focused coping: 56-70

Scoring

SCORE	Category
0-23	Inadequate
24-39	Moderately adequate
40-60	Satisfied

The reliability of the scale is 0.74

Data Analysis

The collected data were analysed using descriptive and inferential statistics based on the objectives. Descriptive methods used were frequency, percentage, mean and standard deviation. Inferential statistics like Chi square and correlation coefficient etc. were used to assess the stress and coping among caregivers of patient with schizophrenia. The value of statistical significance was determined as $P < 0.05$.

Results

The study results showed that most of the caregivers 24(32%) were above 50 years and majority 66(88%) were female caregivers. In connection with place of residence 36(48%) of them from urban and having secondary education 34(45.3%). With regard to occupation 47(62.7%) of were home makers and 52(69%) were from nuclear family. The medical expenses for the patient was taken care by only caregivers 76%. Most of the patients were male 53.3%.

Table 1. Distribution of level of stress and coping among Caregivers of patient with schizophrenia

Level of Stress	Frequency	Percentage
Moderate Stress (19-37)	64	85.3
High Perceived Stress (38-56)	11	14.7
Overall Stress (Mean \pm S.D.)31.13 \pm 8.35		
Level of Overall Coping	Frequency	Percentage
Inadequate (0-23)	3	4.0
Moderately adequate (24-47)	61	81.3
Satisfied (48-70)	11	14.7
Overall Stress (Mean \pm S.D.)34.56 \pm 7.76		

Majority of the caregivers of patient with schizophrenia has moderate perceived stress 85.3% and the Overall Stress Mean \pm Standard deviation(SD) score is 31.13 \pm 8.35. Most of the caregivers of patient with schizophrenia has Moderately adequate 81.3 % coping and Overall Stress Mean \pm SD score is 34.56 \pm 7.76. Table 1

Table 2. Mean score of the Coping in various domain among Caregivers of patient with schizophrenia

Coping Domain	Descriptive statistics for coping score		
	Mean	Standard Deviation	Range (Min. – Max.)
Problem focused	52.13	16.94	30.0 – 90.0
Emotion focused:			
Ø Positive distraction	46.26	18.87	20.0 – 90.0
Ø Negative distraction	52.83	10.79	37.5 – 75.0
Ø Acceptance and redefinition	47.85	14.26	11.1 – 77.8
Ø Religion/faith	62.00	16.36	25.0 – 100.0
Ø Denial/blame	54.80	13.49	30.0 – 80.0
Problem and emotion focused	38.31	13.20	13.3 – 60.0

The coping strategy most often used by Caregivers of patient with schizophrenia was religion / faith and the least coping method used was Positive distraction. Table 2.

Table 3 Association between Overall Stress and Demographic variables among Caregiver(N=75)

Demographic variables	Number	Overall Stress Score		Overall coping Score	
		Mean (SD)	F- p value	Mean (SD)	F- p value
Age (years)					
a. 21 – 30	20	34.05 (9.57)	F = 4.545 P = 0.006 **	32.65 (6.39)	F = 12.354 P = 0.000 ***
b. 31 – 40	18	27.28 (8.30)		31.89 (4.21)	
c. 41 – 50	13	35.85 (6.39)		44.38 (9.50)	
d. More than 50 years	24	29.04 (6.36)		32.83 (5.76)	
Education Qualification					
a. No formal education	4	39.50 (12.23)	F = 5.189 P = 0.001 ***	41.25 (7.89)	F = 0.978 P = 0.425
b. Primary education	15	25.67 (6.38)		33.80 (3.09)	
c. Secondary education	34	30.85 (7.31)		34.24 (9.92)	
d. Higher secondary education	14	31.00 (8.26)		35.43 (6.74)	
e. College	8	38.63 (6.67)		32.50 (2.78)	
Occupation					
a. Home maker	47	30.49 (8.56)	F = 0.751 P = 0.526	36.43 (8.53)	F = 2.764 P = 0.048 *
b. Unskilled worker	20	33.40 (9.17)		30.80 (5.74)	
c. Skilled worker	4	28.25 (2.98)		33.00 (0.00)	
d. Professional	4	30.25 (1.89)		33.00 (2.31)	
Type of family					
a. Nuclear family	52	29.60 (7.71)	F = 2.479 P = 0.015 *	34.48 (8.65)	t = 0.132 P = 0.895
b. Joint family	23	34.61 (8.86)		34.74 (5.39)	
Social support					
a. Father/mother	13	31.69 (6.18)	F = 1.570 P = 0.204	43.69 (9.47)	F = 10.771 P = 0.000 ***
b. Brother/sister	22	33.00 (9.64)		33.68 (5.80)	
c. Husband	24	31.67 (7.40)		31.21 (6.94)	
e. None	16	27.31 (8.83)		33.38 (3.36)	
Family monthly income					
b. 2501 – 5000	10	39.40 (13.58)	F = 6.592 P = 0.002 **	34.20 (13.49)	F = 0.935 P = 0.397
c. 5001 – 7500	25	29.36 (8.28)		32.96 (3.03)	
d. > 7501	40	30.18 (5.20)		35.65 (7.98)	
Relationship with the patient					
a. Parents	38	29.71 (9.35)	F = 1.228 P = 0.306	32.63 (6.41)	F = 3.126 P = 0.031 *
b. Spouse	21	33.81 (7.67)		38.29 (10.20)	
c. Siblings	12	30.25 (3.79)		32.92 (3.09)	
d. Grandparents	4	33.25 (10.59)		38.25 (8.69)	

Note: * - P<0.05, ** - P<0.01, *** - P<0.001 level of significant

Perceived stress and coping were found to be significantly associated with a number of variables. The study shows that there was a significant association between age and perceived stress and coping.

Perceived stress had significant association with educational qualification, type of family and monthly family income. Coping had significant association with occupation, social support and relationship with the patient. This association is statistically highly significant at $p < 0.000$ level. Table.3

Table 4 Correlation between Overall Stress and Overall Coping (n=75)

Variable	r	p
Stress Coping	0.529	0.01 **

Note: *- $P < 0.05$, ** - $P < 0.01$, *** - $P < 0.001$ level of significant

Table 4 Show that there is a significant positive correlation ($r = 0.529$, $P = 0.01$) between stress and coping adopted by caregivers of patient with schizophrenia.

Recommendation for Future Study

1. Interventional based studies can be done to strengthen the physical health
2. A comparative study can be done to caregivers of patient with acute and chronic schizophrenia
3. A qualitative study can be conducted to explore psychosocial aspect of caregivers of patient with schizophrenia

Conclusion and Implication

The present study shows that moderate stress and moderately adequate coping strategies are adopted by the caregivers of patient schizophrenia. Perceived stress and coping were found to be significantly associated with a number of variables. The study shows that there was a significant association between age and perceived stress and coping. Perceived stress had significant association with educational qualification, type of family and monthly family income. Coping had significant association with occupation, social support and relationship with the patient. This association is statistically highly significant at $p < 0.000$ level. The Study reveals a significant positive correlation between perceived stress ($r = 1.0$) and coping ($r = 0.529$).

The findings of this study urge the mental health care professionals to be actively involved in prevention of mental illness and promotion of mental health through the assessment of stress perceived by the caregivers of mentally ill in order to help them to be resilient and use more constructive coping strategies in stressful situations. Caregiver Empowerment strategies can be highlighted in the nursing curriculum and can be thought at basic level and separate speciality or clinic which will be taken care by mental health Nurse for handling caregivers can reduce the further burden and stigma.

Ethical Clearance: Institutional ethics committee (IEC) of SRIHER (DU) approved the study

Conflict of Interest: Authors do not have anything to disclose and declare not conflict of interest.

Informed Consent: Informed consent was obtained from the participants with the option to withdraw them from the study at any time.

Source of Funding: None

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Role of Diagnostic Laparoscopy in Chronic Pelvic Pain

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Abstract

Introduction: Chronic pelvic pain is non cyclic pain of six or more months duration that localizes to the anatomical pelvis, anterior abdominal pain at or below umbilicus, the lumbosacral back, or the buttocks, and is of sufficient severity to cause functional disability or lead to medical care¹Chronic pelvic pain is one of the most common gynecological symptoms and one of the most important in terms of social costs

Objective: To study the role of diagnostic laparoscopy in chronic pelvic pain. To compare the findings of laparoscopy in patients of chronic pelvic pain and patients undergoing routine laparoscopic tubal ligation.

Materials and Method: This study was conducted at Saraswathi institute of medical sciences(HAPUR,U.P) during the period between January 2018 to December 2019. Total 110 cases were enrolled.55 cases who had been suffering from chronic pelvic pain for 6 months (or more) were taken as study group-(A).55cases without any symptoms who underwent laparoscopic sterilization were taken as control group-(B).

Results: 10.60% cases with chronic pelvic pain had normal findings whereas 25.25% cases were normal on laparoscopy. Endometriosis was suspected in 7.27% cases on ultrasonography, where as it was confirmed on laparoscopy in 18.1%.Similarly PID was suspected in 12.72% cases whereas it was confirmed on laparoscopy in 14.54% cases.

Conclusion: In our study we could conclude that the treatment of cases of chronic pelvic pain post diagnostic laparoscopy are adhesiolysis, endometriotic cyst removal, Ovarian Cystectomy and Hydrosalpinx.

Keywords: endometriosis, cystectomy, laproscopy

Introduction

Chronic pelvic pain is non cyclic pain of six or more months duration that localizes to the anatomical pelvis,anterior abdominal pain at or below umbilicus,the lumbosacral back, or the buttocks,and is of sufficient severity to cause functional disability or lead to medical care¹Chronic pelvic pain in one of the most common gynecological symptoms and one of the most important

in terms of social costs.Chronic pelvic pain (CPP) is a common symptom and a difficult condition to manage specially during adolescence.Too often the physical signs are not specific².Chronic pelvic pain is more common than its cause being diagnosed. There is no correlation between pain and amount of tissue damage. It affects many women and leads to significant impairment in their quality of life. Howard conducted a study and found that 61% of the patients with chronic pelvic pain were found to have endometriosis, pelvic adhesions, pelvic inflammatory disease and ovarian cysts. women with primary infertility who were asymptomatic went for laparoscopy found the similar results in 28% of this study group. Therefore, the researcher stated that laparoscopy should be the last method used in etiology research and concluded that laparoscopy is still controversial. Our study aimed to investigate the causes for chronic

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pelvic pain using laparoscopy and compare the results with asymptomatic patients undergoing laparoscopic sterilization.

Material and Method

The prospective study was conducted at Saraswathi institute of medical sciences, Hapur the period of 2018-2019.

Total 110 cases were enrolled. 55 cases who had been suffering from chronic pelvic pain for 6 months (or more) were taken as study group-(A). 55 cases without any symptoms who underwent laparoscopic sterilization were taken as control group-(B).

Selection Criteria :

cases from age 20-40 years

Exclusion Criteria

(1) Women with morbid obesity, severe hypertension, coronary artery disease, acute bronchiolitis, chronic obstructive lung disease.

(2) Women having systemic illness, cardiac illness, bleeding disorders and coagulopathies

(3) Women having local abdominal infection and PID

Method of Analysis

McNemar Chi square test.

The test is applied to a 2×2 contingency table, which tabulates the outcomes of two tests on a sample of n subjects, as follows.

Results

A Prospective study was conducted in Saraswathi institute of medical sciences, Hapur from 2018-2019. Total 110 cases were enrolled. 55 cases who had been suffering from chronic pelvic pain for 6 months (or more) were taken as Study Group (Group A). 55 cases without any symptoms who underwent laparoscopic sterilization were taken as Control Group (Group B).

Following results were obtained.

In present study, the mean age for the study group

(Group A) was found to be 28.6 years with a range of 20- 40 years while for the control group (Group B) mean age was found to be 30.3 years with a range of 18-40 years. Both Groups were comparable as far as age is considered.

The incidence of chronic pelvic pain was found to be highest in Gravida 2 (41.81%) and lowest in infertility (1.87%). In control Group (B), maximum number of cases were Gravida 2 (45.45%). In current study also in Group A maximum number of patients were Educated till primary level (47.27%) followed by education till secondary level (41.81%). Similarly in group B also maximum number of patients were educated till primary level (45.45%) followed by education till secondary level (41.81%).

Incidence of history of previous Surgery was found to be 27.27% in Group A as compared to 38.18% in Group B. Maximum number of cases reported with Chronic pelvic pain lasting from 6-9 months (63.64%). Only one patient (1.22%) reported with Pain lasting from 22 months. Mean duration of chronic pelvic pain before laparoscopy was found to be 10.49 ± 7.46 months.

In current study Maximum number of cases (56.36%) had no other symptoms associated with Chronic pelvic pain. Associated vaginal discharge was present in 20.00% cases 14.54% cases had dysmenorrhea and 7.27% patients presented with dyspareunia. One patient (1.81%) had associated infertility. 36.36% cases with chronic pelvic pain had normal per vaginal findings. 14.54% cases each had fornix tenderness and retroverted uterus. In 12.72% cases endometriosis was suspected.

In Present study 60% Cases with chronic pelvic pain had normal USG findings. 12.72% women had free fluid in POD. Adnexal cyst was present in 7.27%, Hydrosalpinx was present in 5.45% cases. TO mass and fibroid could be visualized in 3.63% cases and cases of chronic pelvic pain endometriosis 18.18% was the most common pathological finding found on laparoscopy and 7.27% cases had Endometriosis in Group B. chronic pelvic inflammation found in 14.54% in Group A and 9.09% in Group B Adhesions were found in 9.09% cases in Group A and 7.27% cases in Group B. These patients Underwent adhesiolysis.

In our study we found that normal per vaginal findings were found in 72.72% cases of chronic pelvic pain whereas on laparoscopy normal finding were seen only in 25.45%. PID could be diagnosed in 14.54% cases which was confirmed by laparoscopy. Endometriosis could be diagnosed clinically only in 3.63% cases as compared to 18.18% cases diagnosed by laparoscopy.

Extraperitoneal gas insufflation occurred in 3.63% cases of Group A and 5.45% cases of Group B. Shoulder pain and wound infection occurred in one case each (1.81%) in Group A. No other complications occurred in both the groups.

In cases of chronic pelvic pain adhesiolysis was done in 9.09%, Endometriotic cyst removal was done in 9.09%. Ovarian Cystectomy was done in 7.27% and Hydrosalpinx removal was done in 5.45% cases.

Discussion

The present study was a prospective randomized controlled study conducted at department of Obstetrics and Gynecology, Saraswathi institute of medical sciences, hapur. The purpose of the study was to analyse the role of diagnostic laparoscopy in chronic pelvic pain. The study was carried out from 2018- 2019. Total 110 cases were enrolled. 55 cases who had been suffering from chronic pelvic pain for 6months (or more) were taken as study group (A). 55 cases without any symptoms who underwent laparoscopic sterilization were taken as control group (B). Different authors have different definitions of chronic Pelvic pain. Howard redefined the definition of chronic pelvic pain in 2001 as pain lasting for 6months or more.

Demographic Characteristics

Age

In present study, the mean age for the study group (Group A) was found to be 28.6 years with a range of 20- 40 years while for the control group (Group B) mean age was found to be 30.3 years with a range of 18- 40 years. Both Groups were comparable as far as age is considered. Demir et al (2011) conducted a study on 44 patients with chronic pelvic pain as Study Group and 31 patient who had laparoscopic tubal ligation as control Group.

Gravity

In present study the incidence of chronic pelvic pain was found to be highest in Gravida 2 (41.81%) and lowest in infertility (1.87%). In control Group (B), maximum number of cases were Gravida 2 (45.45%). In a study by Hebbler and Chawla (2005) in cases of chronic pelvic pain, Parity ranged between 0 to 8 and nine women were Nulliparous²². 86 patients of chronic pelvic pain was studied by Zubor (2000) in which mean parity was 1.6, ranging from 0 to 5.¹²

Education

In current study also in Group A maximum number of patients were Educated till primary level (47.27%) followed by education till secondary level (41.81%). Similarly in group B also maximum number of patients were educated till primary level (45.45%) followed by education till secondary level (41.81%).

Socioeconomic Status

In current study, the incidence of chronic pelvic pain in Group A was found to be highest in Middle class (58.18%) and lowest in lower class (12.72%). Similarly in Group B maximum number of cases were found to be in middle class (74.54%) and lowest in lower class (3.63%). There was no statistically significance difference between the two Groups as far as socioeconomic status was concerned.

History of Previous Surgery

In present study Incidence of history of previous Surgery was found to be 27.27% in Group A as compared to 38.18% in Group B. Hebbler et al (2005) studied 86 patients of chronic pelvic pain and found that nineteen patients had history of previous surgery and nine women had history of first trimester MTP. Eight had undergone D and E.²⁰

Duration of Pain

In Present study maximum number of cases reported with Chronic pelvic pain lasting from 6-9 months (63.64%). Only one patient (1.22%) reported with Pain lasting from 22 months. Mean duration of chronic pelvic pain before laparoscopy was found to be 10.49±7.46 months. In a study by Zupor (2000), 86 Patients with chronic pelvic pain were studied and average pain

duration was found to be 11.5 months.¹⁹

OTHER SYMPTOMS ASSOCIATED WITH CPP

The long duration pelvic pain symptomatology when subjected to proper clinical assessment, investigations and procedural interventions commonly concluded and correlated in the past with the clinical conditions like dysmenorrhea, dyspareunia, abnormal uterine bleeding, infertility, vaginal discharge, etc. In Study by Hebbert et al (2005) in cases of chronic pelvic pain, most patients presented with acyclic abdominal pain (79.1%) followed by congestive dysmenorrhea (26.7%).¹⁰

PER VAGINAL FINDINGS

In present study 36.36% cases with chronic pelvic pain had normal per vaginal findings. 14.54% cases each had fornix tenderness and retroverted uterus. In 12.72% cases endometriosis was suspected. In a Study by Hebbert (2005) 86 patient of chronic pelvic pain was studied. Pelvic tenderness was found to be most common (27.9%), followed by fornix fullness (15.1%). 61.6% women did not reveal any significant pathology.²¹

USG

Compared to laparoscopy ultrasound has a little or no value in diagnosing endometriosis but it can help in making or excluding the diagnosis of an ovarian endometrioma. The typical ultrasound features of an endometriotic ovarian cyst in premenopausal women were described as "ground glass echogenicity of cyst fluid, one to four locules and no solid parts". In Present study 60% Cases with chronic pelvic pain had normal USG findings. 12.72% women had free fluid in POD. Adnexal cyst was present in 7.27%, Hydrosalpinx was present in 5.45% cases. TO mass and fibroid could be visualized in 3.63% cases.

COMPARISON OF LAPAROSCOPY FINDING IN BOTH GROUP

In present study cases of chronic pelvic pain endometriosis 18.18% was the most common pathological finding found on laparoscopy and 7.27% cases had Endometriosis in Group B. chronic pelvic inflammation found in 14.54% in Group A and 9.09% in Group B Adhesions were found in 9.09% cases in Group A and 7.27% cases in Group B. These patients

Underwent adhesiolysis. Ovarian cyst was more common in Group B 14.54% as compared to Group A 7.27% in these cases cystectomy was done. Fibroid and TO mass found in 3.63% in Group A whereas in Group B. 63% cases had small fibroid and no TO mass found in Group B. Fibroid was medically managed whereas in TO mass antibiotic was given.

COMPARISON OF PER VAGINAL FINDINGS WITH LAPAROSCOPY

In our study we found that normal per vaginal findings were found in 72.72% cases of chronic pelvic pain whereas on laparoscopy normal finding were seen only in 25.45%. PID could be diagnosed in 14.54% cases which was confirmed by laparoscopy. Endometriosis could be diagnosed clinically only in 3.63% cases as compared to 18.18% cases diagnosed by laparoscopy. Hebbert & Chawla (2005) showed there was better correlation between abnormal preoperative pelvic examination and abnormal laparoscopic findings¹⁴.

COMPARISON OF USG FINDINGS WITH LAPAROSCOPY.

In our study Normal findings were seen in 60% cases of chronic pelvic pain on USG as compared to 25.14% cases on laparoscopy. Endometriosis could be diagnosed only in 7.27% cases on USG as compared to 18.18% cases on laparoscopy. Study by Zubor et al (2000) revealed pelvic organ pathology in 88.4% of patients and the most frequent finding was endometriosis (31.4%). Preoperative Ultrasonic examination with pelvic pathology findings performed in 36 patients and laparoscopy correlated with ultrasonographic findings in 31 (81.6%)¹⁵.

COMPLICATIONS OF LAPAROSCOPY

In present study Extraperitoneal gas insufflation occurred in 3.63% cases of Group A and 5.45% cases of Group B. Shoulder pain and wound infection occurred in one case each (1.81%) in Group A. No other complications occurred in both the groups. Kang et al (2007) studied 3068 cases of chronic pelvic pain. In their study 85 complications associated with diagnostic laparoscopy including 3 cases of major complications.

Mortality

Vilos GA et al (2007) in their study concluded that bowel and visceral injuries from Veress needle insertion or trocar placement may occur. They may or may not be seen at the time of the injury. The delayed presentation contributes to the morbidity and mortality of bowel injuries. The incidence of bowel injury is between 0.04% and 0.5%.

Operative Procedures

In cases of chronic pelvic pain adhesiolysis was done in 9.09%, Endometriotic cyst removal was done in 9.09%. Ovarian Cystectomy was done in 7.27% and Hydrosalpinx removal was done in 5.45% cases. Demir F et al (2012) conducted a study of 44 patients with chronic pelvic pain out of which they performed adhesiolysis and ovarian cyst removal in 8 patients, endometrioma excision was done in nine cases and lastly salpingectomy and endometrioma cauterization was done in one patient each¹⁸

Conclusion

In this study we can conclude that laparoscopy is an excellent tool in evaluation of patients with pelvic pain, because diagnosis and often treatment can be accomplished in one sitting, without subjecting the patients to exploratory laparotomy. In the study population per vaginal finding found to be normal in majority of cases and endometriosis found to be the most common laparoscopic finding and almost undetectable on per vaginal examination.

Ethical Clearance- Taken from ethical committee of institute

Source of Funding- Self.

Conflict of Interest- Nil

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Determination of Occlusal Splint Thickness for TMJ Derangement based on MRI- A Review

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Abstract

Aim: To review the accuracy of thickness of occlusal splints, used for particular temporomandibular joint derangement based on MRI findings.

Objective: To understand the various aspects of managing Temporomandibular joint derangement and the accuracy of MRI scans in determining the thickness of occlusal splints.

Background: Occlusal splints are a standard method to treat the pain associated with temporomandibular joint derangement. They can be further classified into three groups on the basis of function: stabilization splints, distraction splints and anterior repositioning splint. MRI findings help clinicians in complete assessment and determining the strategy of management of TMJ dysfunction. Its main advantages include: higher accuracy of the anatomical structures, detection of changes in soft tissue, necrosis, edema, is a noninvasive procedure and does not offer exposure to ionizing radiation.

Reason: To gain knowledge and understanding about the occlusal splint thickness for particular temporomandibular joint derangement based on MRI findings.

Keywords : *Anatomy, Occlusal splint ,temporomandibular joint , Magnetic resonance imaging , TMJ dysfunction, TMJ derangement*

Introduction

Temporomandibular joint is one of the most complex joints which mainly helps in mastication, phonetics and opening and closing of the mouth. Temporomandibular joint is located at the front of the middle ear with a disc which has the capacity to bear pressure separating the mandible from the skull (temporal bone). To diagnose temporomandibular joint disorders it is important to understand the anatomy of the joint. It is a complex compound diarthroidal synovial joint. It can be structurally and functionally be divided into a lower and upper compartment. The lower compartment comprises of tissues that surround the condyle and articular disc. The disc is bound to the condyle by lateral and medial ligaments of the disc and is responsible for the rotational movement of the TMJ. This is the hinge movement of a joint similar to an elbow joint . The upper compartment comprises of the condyle-disc complex functioning against the surface

of the mandibular fossa. The disc is not attached to the fossa so translation movement can occur. This is the sliding component of the joint. Temporomandibular joint dysfunction is a term which encompasses a range of clinical disorders the masticatory musculature and/or the temporomandibular joint [1]. Proper recording of the clinical findings and diagnostic data is important for diagnosing for the temporomandibular joint disorder. Many surgical or non-surgical treatments have been reported to restore the correct disc-condylar relationship. Some researchers have advocated the use of an adjunctive pumping and hydraulic pressure technique and reported great improvement in clinical symptoms and a higher incidence of disc reduction [2,3]. Previously, many surgical or nonsurgical methods of treatment have been reported to restore a correct disk-condylar relationship. Mandibular protrusive repositioning splint therapy (often called a disk repositioning splint) is one type of treatment and to gain a “normal” disk-condyle relationship [4,5]. Only about 3%-7% of the patients with

pain related to TMJ seek medical attention [6,7]. Many surgical or non-surgical treatments have been reported to restore the correct disc-condylar relationship. The disorders of temporomandibular joint can be mainly categorised into myofascial pain, intracapsular problems and Arthritis or degenerative joint disease.

Myofascial pain is the most commonly encountered type of temporomandibular joint disorder. It involves the muscles of the facial complex as opposed to the joint. The condition usually manifests as frequent headaches and sore muscles, as well as pain when chewing. It can affect people of all ages, most commonly seen in children. It is sometimes accompanied by frequent headaches. Degenerative joint disease usually manifest in individuals with Osteoarthritis, Rheumatoid arthritis and Psoriatic arthritis.

The Temporomandibular joint is one of the last diarthrodial joints to develop in utero and does not emerge in the facial region until the 8th week of intra uterine life. The maxilla and mandible, muscles of mastication, and biconcave disc develop from the first branchial arch through the 14th week of intra uterine life. The TMJ is considerably underdeveloped at birth in comparison to other diarthrodial joints making it susceptible to perinatal and postnatal insults. The joint continues to develop in the early childhood years as the jaw is utilized for sucking motions and eventually masticatory function.

A diagnostic accuracy of 95% has been established comparing postmortem cryosections to previous TMJ-MRI (Westesson et al. 1985; Tasaki and Westesson 1993), whereas arthrography shows merely 83% accuracy combined with videofluoroscopy (Westesson and Bronstein 1987) and is associated with radiation exposure, invasive and may be complicated by allergy, infection and pain. Magnetic resonance imaging (MRI) is the most widely used and is diagnostic technique of choice. MRI has a promising approach in dentistry. MRI has become one of the best methods in recent decades as it is non-invasive, and uses non-ionizing radiation and its ability to differentiate between the soft and hard tissues. In the recent past the MRI has found widespread usage in dentistry despite the high cost, differential and limited accessibility of the MRI equipment. MRI being a non-invasive technique with the use of non-ionizing radiation

has been used in diagnosis of TMJ disorders, soft tissue pathologies and bone topography for the placement of the dental implants [8]. MRI demonstrates the internal structure of TMJ with great precision and contrast resolution. The MRI findings in terms of functional aspect of disc position, degree of disc displacement, disc deformity, joint effusion, and osteoarthritis has been used for the prediction of Temporomandibular Dysfunction (TMD) symptoms in patients with and without TMJ disorders. The anterior disc displacement as seen in the MRI correlates well with the presence and absence of the symptoms of TMJ disorders. The findings are in agreement with study conducted by Kumar et al., [9].

The main purpose of this review is to gain knowledge and understanding about the occlusal splint thickness for particular TMJ derangement based on MRI findings and to determine its efficiency when compared to the other imaging modalities that are available.

Magnetic resonance imaging(MRI) :

MRI is an advance imaging modality which uses mainly non-ionising radiation. It was initially called as Nuclear Magnetic Resonance Imaging after its early use for chemical analysis. The word 'Nuclear' was the omitted as it instigated a fear among the public that there might be something radioactive involved in the procedure. Historically, Block and Purcell discovered the nuclear magnetic resonance (NMR) phenomenon. However, it was only in 1970s that Damadian applied the techniques of NMR to imaging. MRI has been applied successfully in imaging and diagnostic measures of the hearts, brain, spine, peritoneal and retroperitoneal structures, as well as in musculoskeletal anatomy and pathology. Previous studies also state that MRI has been of high diagnostic importance and an effective imaging modality for meniscal, ligamentous, osseous, and articular structures of various joints of the body [10,11].

Applications of MRI in dentistry:

MRI plays a significant role in diagnosis and management of diseases. It has many advantages when compared to the other modalities. In dentistry, MRI has been found to be extremely useful in eliciting the exact anatomical location and extent of the disease. Moreover, ultrasonography cannot show the associations between

a tumor and adjacent structures, and thus, it is indicated to use MRI whenever tumors are big or judged to have higher possibility for malignancy or intruded to adjacent structures^[10]. The other advantage of MRI is the lack of ionizing radiation and excellent soft-tissue contrast. Involvement of condyle of mandible is not that apparent on radiographs or computed tomography images. MRI has an important role in examining the true extent of the lesions as there may be slight changes in areas which looks normal on radiographs or CT. Magnetic resonance imaging (MRI) is considered the “reference standard” for imaging of the temporomandibular joint (TMJ)^[11,12] MRI along with gadolinium (GAD) enhancement has been proven to detect inflammation in the temporomandibular joints of adults^[13] and early inflammatory changes in other joints, such as the knees and wrists^[14,15] before the onset of morphologic changes detected by other forms of conventional radiography.

Occlusal splint therapy

Occlusal splints are usually designed to cover the occlusal surfaces of the teeth resulting change in occlusion to be responsible in part or in total for the therapeutic effect. There are various types of occlusal splints (bite plates or intra-oral appliances of variable designs used in the management of TMD) and described in the literature. There is one type of occlusal splint called as the stabilization splint. It is also called as the Tanner appliance, the Fox appliance, the Michigan splint, or the centric relation appliance. The stabilization splint is made up of acrylic and helps in providing a temporary and removable ideal occlusion (ideal contact between the teeth for the muscles and the temporomandibular joints)^[16,17]. After few visits, the muscles of mastication tends to relax and thereby reducing stress on the temporomandibular joint. This usually takes about 2-3 months^[17]. Other than the stabilization splint, there are other types of splint namely: Non occluding splints, soft splints and bite plates. Hard splints along with counselling have proven to show the best results.^[18] Previous studies about the comparison of the efficiency of the various types of splints have shown different results. Dao et al. conducted random controlled studies which showed that there was no significant clinical difference between the types of splints^[19]. Whereas Rubinoff et al.^[20] found a minor difference between their efficiencies and Ekberg et al^[21] reported that the stabilizing splint

had significantly better than the other types.

Effectiveness of MRI in occlusal splint therapy

The temporomandibular joint can be demonstrated using both sagittal and coronal imaging planes. The sagittal plane helps in the recognition of the relative position of the disc and condyle in a antero-posterior direction. The coronal sections of the MRI demonstrates the medial and the lateral

position of the disc relative to the condyle.^[22] In the sagittal section, a normal disc has a biconcave lens-like configuration with the posterior band at a 12 o'clock position in relation to the condyle. An anteriorly displaced disc has its posterior band forward of the 12 o'clock position and usually has an alteration in disc configuration. The moderately low signal intensity of the disc is usually well demarcated from the relatively higher signal structures such as the lateral pterygoid fat pad and bilaminar zone posteriorly^[23]. In the coronal plane, the disc has an arc-shaped configuration with its medial and lateral margins attaching to the medial and lateral poles of the condyle respectively^[23]. It has also been found that with MR images internal disc displacement appears to be present in asymptomatic individuals while in other patients who are symptomatic, there is often a lack of evidence of internal disc displacement. This suggests that TMJ dysfunction may be caused by factors which are independent of internal disc displacement or may act in combination with it^[24]. The introduction of MRI as a diagnostic tool for Temporomandibular joint dysfunction enables the clear visualization of the static position of the disc relative to the condyle^[25].

Conclusion

The temporomandibular joint is one of the most complex joints which has been very difficult to understand and treat is the past. MRI is an advance imaging modality which uses mainly non-ionising radiation. Occlusal splints are usually designed to cover the occlusal surfaces of the teeth resulting change in occlusion to be responsible in part or in total for the therapeutic effect. Thus Magnetic resonance imaging can be used as a efficient diagnostic tool for dysfunction involving the temporomandibular joint. However, further studies have to done for further

Ethical Clearance: The study was carried after ethical approval from The Department of Research, Saveetha Dental College and Hospitals, Saveetha University.

Source of Funding : Self funding.

Conflict of Interest: NIL.

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Clinical Profile of Amblyopia in Young Adults

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Abstract

Aim: To study clinical profile of amblyopic patients in relation to refractive status, socio economic status, use of glasses and social impact on society.

Results: Hypermetropies improving to 6/9 is 13% and myopes improving with spectacles are 45% and mixed astigmatism 69%. Most common age group for detection of amblyopia in young adults is 21-30 years(47.1%) with predominance of female(55.7%) belonging from middle class families (81.4%) having studied mostly from Government Marathi medium school(45.7%) with previously not using given glasses(57.1%) and with taken amblyopia of only (7.1%) and with spectacles maximum correction with mixed astigmatism (54.2%) between 6/36-6/9 in right eye (43%) and in left eye (30%) .

Interpretation: Lack of school screening programs and awareness for health check-up delays the diagnosis of amblyopia leading to non-improvement of vision and due to lack of knowledge and social stigma girls especially avoid wearing glasses even after prescribing leading to amblyopia.

Conclusion: School health camps, proper health education, timely examination, and proper use of spectacles is must.

Keyword: Myopics: M ,Hypermetropics: H

Introduction

Amblyopia is a “developmental defect of spatial visual processing that occurs in the central visual pathways of the brain.” It presents most dramatically as loss of visual acuity in one or, rarely, both eyes, but amblyopia is more than this; certain forms of amblyopia also present with diminished contrast sensitivity, Vernier acuity, grating acuity, and spatial localization of objects. These defects may be explained by the mechanism of lack of use of an eye because of media opacity or extreme refractive errors that cause a chronically blurred image to form on the fovea of that eye; however, the cause of amblyopia in an eye that has strabismus is not as straightforward and is the result of abnormal binocular interaction¹.

Types of amblyopia²: -

- 1.Strabismic
- 2.Stimulus deprived

3.Anisometric

4.Bilateral ametropic

5.Meridonal

- In the absence of an organic lesion, a difference in best corrected VA of two Snellen lines or more (or >1 log unit) is indicative of amblyopia³.
- Visual acuity in amblyopia is usually better when reading single letters than letters in a row. This ‘crowding’ phenomenon⁴ occurs to a certain extent in normal individuals but is more marked in amblyopes and must be taken into account when testing preverbal children⁵.

Aim: -

To study clinical profile of amblyopic patients in relation to refractive status, socio economic status, use of glasses and social impact on society.

Inclusion Criteria: -

- Patients of age <30 years
- Visual acuity less than log mar 0.2 in one eye or both eyes without any organic cause

Exclusion Criteria: -

Vision affected due to any cause anterior segment or posterior segment cause

Study Design: -

- Hospital based longitudinal non-randomized study.

Materials and Method

- All the young adults up to the age of 30 years coming to Department of ophthalmology, KIMS DU Hospital, Karad were screened out by taking visual acuity and correction with refraction for amblyopia over a period of 1 year from August 2018 to July 2019.

SAMPLE SIZE: -

- 70 patients were enrolled

Observations and Results**Observation:**

TABLE 1 This table shows that sample size of 70 cases when given the vision correction with refraction the result comes out to be 43 patients that is 50.2% of patients had spherical correction and amongst them 26 patients that is 37.1% are myopic correction and 17 patients that is 24.2% are hypermetropia correction.

This table also shows about the cylindrical correction which is minimum only in 8 patients that is 11.4% and remaining 19 patients that is 27.14% patients have mixed correction.

- **TABLE 2** : Taking results from above table now further extending our discussion regarding correction and its visual acuity relation, this table will discuss about relation of hypermetropies with its visual acuity correction.

Amongst the hypermetropies that is total 17 patients so here n=17, out of them 10 patients power for refraction

comes out to be between (+2.5- +5) and amongst the 10 patients only 3 patients that is 30% have full correction but 60% that is 6 patients have correction till log mar 0.4-1 and only 1 patient could have correction till log mar 1.

Rest of 23.07% patients have correction till +2 in which 75% patients have good visual correction ranging from log mar 0-0.3 .

- **TABLE 3:** This table gives you the Relation of myopia with visual acuity correction. The total patients which comes out to be myopic are 26 that is 37.1% and amongst them 76.8% Patients who had myopic correction had spectacles of more than -2 power

- Precisely, 38.4% patients' spectacles range from 2-5sph and amongst them 70% patients their visual acuity correction is up to logmar0-logmar 0.3 which is almost full correction and rest 38.4% patients have spectacles no. more than 5sph for which spectacles correction for 50% patients is > logmar1.

- Rest 23% patient having spectacles correction <-2 visual correction ranges from log Mar 0-logmar0.3

- **Conclusion—low myopic number have good spectacles correction but very high myopic number do not have full correction even if higher refraction is given.**

- MOST OF AMBLYOPIC MALE (42.3%) AND FEMALE (53. %) ARE MYOPIC.

TABLE 4: RELATION OF AMBLYOPICS WITH THE TYPE OF SCHOOL STUDIED FROM:

This table shows that out of 70 students, 56 students have studied from Marathi medium government school and 10 from semi -government and only 4 from private school.

TABLE 5:

This table shows the relation between the type of school to its regular school health check-up , and the socio economic status regarding glasses advised and still not using.

The results shows that out of 56 marathi medium students only 23 had school health check up , and

amongst them only 20 were advised glasses previously and only 10 students were using it .

Semi-govt schools are better in position as out of 10 , 9 had school check up and 5 were advised previously to wear glasses but only 4 are wearing.

Private schools are conducting school check ups regularly as all 4 had previously school health check up done and all 4 are wearing spectacles though not regularly.

Table 1: With N=70, Patients with Different Spectacles Number are as Follows:-

SPHERICAL -MYOPIA	26(37.1%)
SPHERICAL -HYPERMETROPIA	17(24.2%)
CYLINDRICAL	08(11.42%)
MIXED	19(27.14%)

TABLE 2:

SPECTACLES	+2	+2.25 - +5	> +5	Total
NO. OF PATIENTS	4(23.5%) Log0-0.3 0.4-1 >log1 3(75%) 0(0%) 1(25%)	10(58.8%) Log0-0.3 0.4-1 >log1 3(30%) 6(60%) 1(10%)	3(17.6%) Log0-0.3 0.4-1 >log1 2(66.6%) 1(33.3%) 0(0%)	17

Relation of HYPERMETROPIA with visual acuity (N=17)

TABLE 3: Relation of MYOPIA with visual acuity (N=26)

SPECTACLES	-2	-2.25 -- -5	>-5	Total
NO. OF PATIENTS	6(23.07%) Log0-0.3 0.4-1 >log1 5(83.3%) 1(16.6) 0	10(38.4%) Log0-0.3 0.4-1 >log1 7(70%) 2(20%) 1	10(38.4%) Log0-0.3 0.4-1 >log1 2(20%) 3(30%) 5(50%)	26

TABLE 4: REALTION OF AMBLYOPIC STUDENTS WITH THEIR TYPE OF SCHOOL

	MARATHI MEDIUM	SEMI- GOVT	PRIVATE SCHOOLS
N=70	56	10	4

TABLE5: RELATION between type of school and previously done school health check up.

	SCHOOL CHECK UP	ADVICED GLASSES (FROM SCHOOL / OUTSIDE)	WEARING GLASS
MARATHI (56)	23	20	10
SEMI GOVT (10)	9	5	4
PRIVATE (4)	4	4	4

Discussion

- This study is conducted on all the young adults up to the age of 30 years coming to Department of ophthalmology, KIMSDU Hospital, Karad by taking visual acuity and correction with refraction for amblyopia over a period of 1 year from August 2018 to July 2019. This study was approved from institutional ethics committee. This study is done with the primary aim to see clinical profile of amblyopic patients in relation to refractive status, socio economic status, use of glasses and social impact on society.

- In this study the sample size of 70 cases when given the vision correction with refraction the result comes out to be 43 patients that is 50.2% of patients had spherical correction and amongst them 26 patients that is 37.1% are myopic correction and 17 patients that is 24.2% are hypermetropia correction.

- And this study also shows about the cylindrical correction which is minimum only in 8 patients that is 11.4% and remaining 19 patients that is 27.14% patients have mixed correction.

In our study , we now further extending our discussion regarding correction and its visual acuity relation, our further discussion is about relation of hypermetropies with its visual acuity correction.

Amongst the hypermetropies that is total 17 patients so here n=17 , out of them 10 patients power for refraction comes out to be between (+2.5- +5) and amongst the 10 patients only 3 patients that is 30% have full correction but 60% that is 6 patients have correction till log mar 0.4-1 and only 1 patient could have correction till log mar 1.

- Rest of 23.07% patients have correction till +2 in which 75% patients have good visual correction ranging from log mar 0-0.3 .

- In our study we also get the relation of myopia with visual acuity correction.

- The total patients which comes out to be myopic are 26 that is 37.1% and amongst them 76.8% Patients who had myopic correction had spectacles of more than -2 power

- Precisely, 38.4% patients' spectacles range from 2-5sph and amongst them 70% patients their visual acuity correction is up to logmar0-logmar 0.3 which is almost full correction and rest 38.4% patients have spectacles no. more than 5sph for which spectacles correction for 50% patients is > logmar1.

- Rest 23% patient having spectacles correction <-2 visual correction ranges from log Mar 0-logmar0.3

- In our study we also correlate with the type of school which is in direct proportion to its socio-economic status like Marathi medium and semi-govt school students are considered from lower status and private school students are higher socio-economic students.

- This study shows that out of 70 students, 56 students have studied from Marathi medium government school and 10 from semi-government and only 4 from private school.

- In this study shows the relation between the type of school to its regular school health check-up, and the socio-economic status regarding glasses advised and still not using.

- The results show that out of 56 Marathi medium students only 23 had school health check-up, and amongst them only 20 were advised glasses previously and only 10 students were using it.

- Semi-govt schools are better in position as out of 10, 9 had school check-up and 5 were advised previously to wear glasses but only 4 are wearing.

- Private schools are conducting school check-ups regularly as all 4 had previously school health check-up done and all 4 are wearing spectacles though not regularly.

Conclusion

- This study gives us following points to note down:

- 1) Spherical number is more common than mixed or astigmatism

- 2) Myopia is more common than hypermetropia (37.73%)

- 3) Amongst demographic distribution male and female both have more percentage of myopic number.

- 4) 58.8% of hypermetropies have spectacles number between 2-5sph with visual acuity improving up to logmar0.4-1

- 5) Low myopic number have good spectacles correction but very high myopic number do not have full correction even if higher refraction is given.

- MOST OF THE AMBLYOPIA DETECTED PATIENTS (70%) ARE FROM MARATHI MEDIUM SCHOOL AND FROM MIDDLE CLASS FAMILIES WHERE ROUTINE SCHOOL HEALTH CHECK UPS ARE NOT CONDUCTED PROPERLY SO NOT DIAGNOSED ON TIME, ONLY 30% OF STUDENTS WHO STUDIES IN ENGLISH MEDIUM PRIVATE SCHOOLS HAVE PROPER SCHOOL HEALTH CHECK UP SO WERE DETECTED FOR AMBLYOPIA.

- OUT OF THOSE ONLY 10% STUDENTS WERE WEARING SPECTACLES SO HAD FULL CORRECTION, BUT STUDENTS BELONGING TO MIDDLE CLASS OR LOW SOCIO-ECONOMIC STATUS WHO HAD LESSER AWARENESS ABOUT THE DISEASE HAD NOT WORE GLASSES DUE TO WHICH THEY DONOT HAD FULL CORRECTION.

- OUR STUDY FOCUSES ON THE FACT:

Early detection of amblyopia by proper school health check-up and then treatment of amblyopia and also to avoid those factors causing amblyopia since childhood like proper use of glasses.

Why treats amblyopia? ⁶ Direct benefits include potentially improved stereoptic appreciation and the occasional realignment of strabismic eyes with attainment of improved visual acuity. For most patients, the creation of a better-sighted⁷ “spare tire” should trauma or disease claim the sound eye is all that can be promised logically. Of interest is a study that showed a threefold greater risk of loss of the sound eye if the other is amblyopic.

Ethical approval: All procedures performed on human participants were in agreement with ethical standards of the Institutional and/or National Ethics Committee.

- **Source of Funding:** Self

- **Conflict of Interest:** None.

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Estimation of Salivary Heat Shock Protein 70 (HSP70) in Children With Early Childhood Caries

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Abstract

Aim: To assess the heat shock protein levels in children with early childhood caries (ECC) and to compare its levels before and after caries control procedure.

Method: 36 children who visited the department of Pediatric and Preventive dentistry and the school dental clinic associated with the department who fit in the inclusion criteria were divided into three group of 12 each. Group 1 was caries free children, group 2 and group 3 were mild to moderate and severe ECC group respectively. Saliva samples were collected pre and post caries control and were analysed for heat shock protein 70 levels. The results were statistically analysed.

Results: The mean value of the salivary Hsp70 levels estimated in the control group of children was 5988.88 pg/ml (± 358.613 pg/ml). Similarly, mean values for the pre-treatment salivary Hsp70 levels estimated in the mild to moderate ECC and S-ECC study groups were 5419.97 pg/ml (± 159.472 pg/ml) and 5982.99 pg/ml (± 610.675 pg/ml), respectively. The post-treatment salivary Hsp70 levels estimated in the mild to moderate ECC and S-ECC study groups were 5148.34 pg/ml (± 365.063 pg/ml) and 5240.55 pg/ml (± 257.023 pg/ml) respectively. Intra-group comparison between the pre-treatment and post-treatment salivary Hsp70 values in the mild to moderate ECC study group showed a statistically significant reduction. The intra-group comparison between the pre-treatment and post-treatment salivary Hsp70 values in the S-ECC study group also showed a statistically significant reduction. Comparisons showed statistically significant difference between control and mild to moderate ECC groups, and between mild to moderate ECC and S-ECC groups, but not between control and S-ECC groups.

Conclusion: With the available evidence and the results obtained in our study, it is safe to assume that levels of salivary Hsp70 can be used as an indicator for dental treatment prognosis and evaluation of efficacy of newer treatment protocols in children.

Keywords: Heat shock proteins, HSP 70, Early Childhood Caries

Introduction

Heat shock proteins (Hsp) are said to be omnipresent in the cells of all the organisms¹. It is now known that an array of stresses, which may be metabolic or environmental in nature such as free radicals, microbial infections, ischemia, surgical stress, hormones induce the production of these proteins.

Of all the heat shock proteins, Hsp70 is said to be stress inducible.² Hsp70 present in saliva can

be considered as a stress marker in poor oral health conditions.³ Hsp70 has been demonstrated as an efficient stress marker within cells in conditions of poor oral health. It has also been shown to increase in the saliva of patients with high caries activity which can be credited to the increased bacterial load resulting from high DMFT score of the individual. The bacterial load is a stressful event which leads to the production of Hsp70 for immune response.⁴

A significant relationship has been established

between caries activity and salivary levels of Hsp70 in adults. However, the correlation between the salivary Hsp70 levels and early childhood caries (ECC) and the effects of treatment of these carious lesions on salivary levels of Hsp70 has also not been studied extensively. Hence, the present study was undertaken to analyse the salivary Hsp70 levels in children with varying severity of ECC and the response to caries control.

Methodology

A total of 36 children in the age group of 36-72 months of age who reported to the Department of Pediatric and Preventive dentistry and school dental clinics associated with the department were selected for the study. The inclusion criteria were a group of 12 caries free children (group 1), children with mild to moderate ECC (group 2) and children with severe ECC (group 3).

Children on any medications, those with systemic and metabolic disorders, those with special health care needs, uncooperative and those without consent from parents were excluded from the study.

Convenience sampling was used for selecting the study subjects and informed consent was obtained from the parents of these children. A thorough dental examination was done to record the oral findings of each patient and profile maintained with the details. Baseline salivary samples were collected from all the three groups.

12 children with no clinical signs of dental caries and who were of good oral hygiene were recruited as controls. Expecting a dropout rate in group 2 and group 3, pre-treatment salivary samples of 16 children in group 2 and 48 children in group 3 were collected prior to caries control procedures. Upon completion of the study, a total of 3 patients from group 2 and 34 patients from group 3 who failed to appear and follow through with study protocol were excluded.

The children from group 2 and group 3 were treated according to the requirement for caries control, which included advice on oral health education, diet counselling, oral prophylaxis, restorative procedures, topical fluoride application and pulp therapy. The patients in group 2 and group 3 were recalled after a period of 21 days and post caries control saliva sample was collected. The collected saliva samples in all the

groups was analysed for heat shock protein 70 (Hsp70) levels by using salivary ELISA kit.

The saliva samples from each child was collected by spitting method. Each child was given sterile 10ml containers and asked to spit into it till a sufficient amount of saliva (minimum 3 ml) was collected. These samples were then labelled and transported to the lab, where they were processed and stored in vials under -80°C temperature, until the ELISA was performed.

Statistical Analysis

Descriptive statistics were tabulated in the form of mean and standard deviation. Inferential statistical analyses were performed for comparison between the data obtained from children in all the groups using paired t-test for intra-group comparison and ANOVA test for inter-group comparison, following the test for normality (Shapiro-Wilk test). The level of significance was fixed at $\alpha=5\%$.

Results

The mean value of the salivary Hsp70 levels estimated in the control group of children were 5988.88 pg/ml (± 358.613 pg/ml). Similarly, mean values for the pre-treatment salivary Hsp70 levels estimated in the mild to moderate ECC and S-ECC study groups were 5419.97 pg/ml (± 159.472 pg/ml) and 5982.99 pg/ml (± 610.675 pg/ml), respectively. The post-treatment salivary Hsp70 levels estimated in the mild to moderate ECC and S-ECC study groups were 5148.34 pg/ml (± 365.063 pg/ml) and 5240.55 pg/ml (± 257.023 pg/ml), respectively.

The pre-treatment inter-group comparison of the mean salivary Hsp70 levels between the control group and the two study groups showed statistically significant differences. [Figure 1]. Post-hoc Tukey test for pairwise comparisons showed statistically significant differences between control and mild to moderate ECC groups, and between mild to moderate ECC and S-ECC groups. There were no statistically significant differences between control and S-ECC groups [Table 1].

The post-treatment inter-group comparison of the mean salivary Hsp70 levels between the control group and the two study groups showed statistically significant differences. [Figure 2]. Post-hoc Tukey test for pairwise comparisons showed statistically significant differences

between the control and ECC groups, and between the control and S-ECC groups, but not between the ECC and S-ECC groups [Table 2].

Intra-group comparison between the pre-treatment and post-treatment salivary Hsp70 values in the mild to

moderate ECC study group was done using paired t-test, which showed a statistically significant reduction [Table 3]. Similarly, the intra-group comparison between the pre-treatment and post-treatment salivary Hsp70 values in the S-ECC study group also showed a statistically significant reduction [Table 4].

Table 1: Pairwise comparisons of control and pre-treatment salivary Hsp70 levels(pg/ml) using post-hoc Tukey test:

Group pairing	Mean	SD	M. Diff	95% CI	p-value (adj)
Control (No ECC) vs Mild to Moderate ECC (ECC)	5988.88	358.613	568.916	150.969, 986.864	0.005
	5419.97	159.472			
Mild to Moderate ECC (ECC) vs Severe ECC (S-ECC)	5419.97	159.472	-563.029	-965.153, -160.905	0.004
	5982.99	610.675			
Control (No ECC) vs Severe ECC (S-ECC)	5988.88	358.613	5.887	-404.832, 416.607	0.999
	5982.99	610.675			

p-value > 0.05 not significant; p-value < 0.05 significant

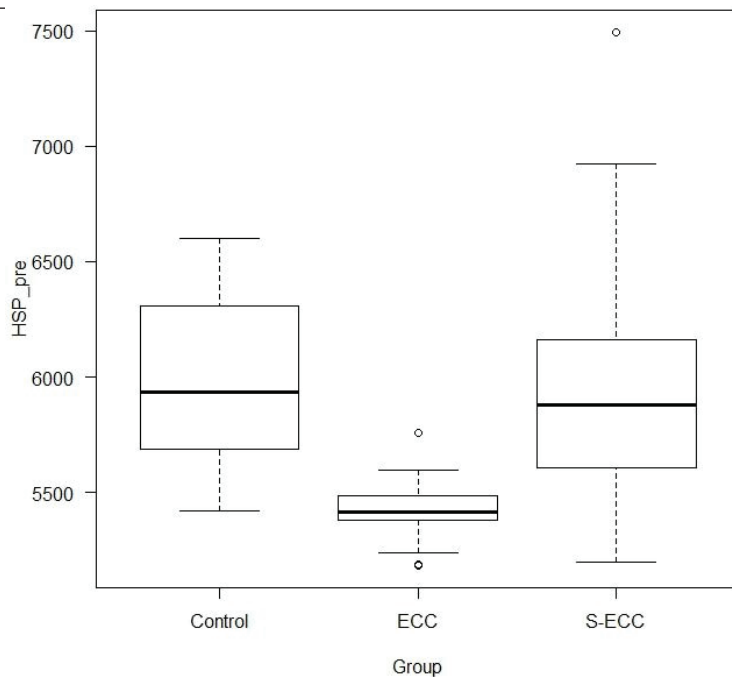


Figure 1: Graphical representation of Inter-group comparison between the control and pre-treatment values of the two study groups.

Table 2: Pairwise comparisons of control and post-treatment salivary Hsp70 levels(pg/ml) using post-hoc Tukey test:

Group pairing	Mean	SD	M. Diff	95% CI	p-value (adj)
Control (No ECC) vs Mild & Moderate ECC (ECC)	5988.88	358.613	840.543	519.609, 1161.478	<0.001
	5148.34	365.063			
Mild & Moderate ECC (ECC) vs Severe ECC (S-ECC)	5148.34	365.063	-92.212	-400.996, 216.571	0.747
	5240.55	257.023			
Control (No ECC) vs Severe ECC (S-ECC)	5988.88	358.613	748.330	432.946, 1063.715	0.001
	5240.55	257.023			

p-value > 0.05 not significant; p-value < 0.05 significant

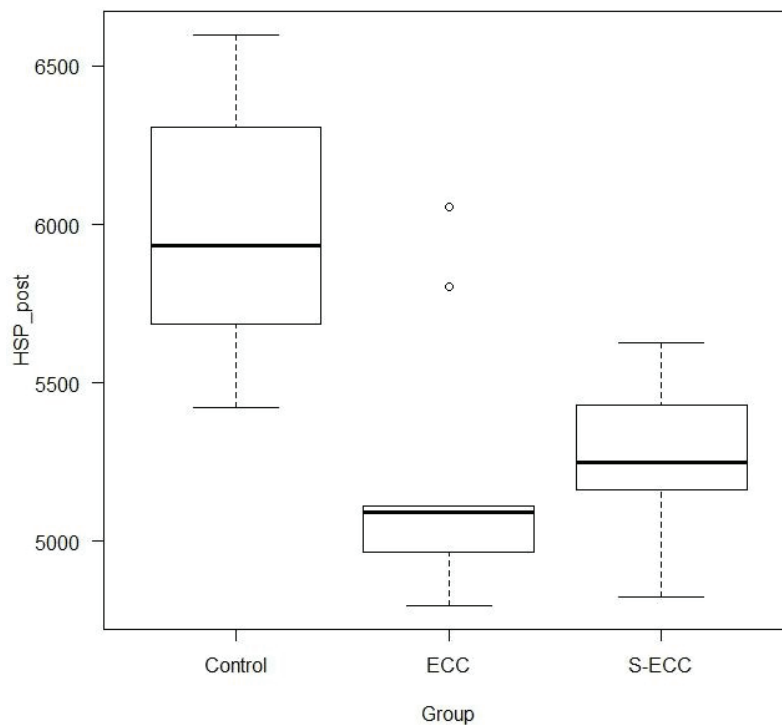


Figure 2: Graphical representation of Inter-group comparison between the control and post-treatment values of the two study groups.

Table 3: Intra-group comparison between Pre-treatment and Post-treatment Hsp70 levels (pg/ml) in Mild to Moderate ECC group using paired t-test:

Group	N	Mean	SD	df	M. Diff	95% CI	t	p- value
Mild to moderate ECC	13	5419.97	159.472	12	271.626	85.407, 457.845	3.178	0.007
	13	5148.34	365.063					
p-value > 0.05 not significant; p-value < 0.05 significant								

Table 4: Intra-group comparison between Pre-treatment and Post-treatment Hsp70 levels (pg/ml) in S-ECC group using paired t-test:

Group	N	Mean	SD	df	M. Diff	95% CI	t	p- value
S-ECC	14	5982.99	610.675	13	742.443	468.019, 1016.868	5.844	<0.001
	14	5240.55	257.023					
p-value > 0.05 not significant; p-value < 0.05 significant								

Discussion

Heat shock proteins (Hsp), also called “stress proteins” are produced by a family of highly conserved genes.¹ There are two forms of heat shock proteins—one which is constitutively expressed, and the other that is induced in stressful conditions.⁵ Hsp70 kDa family (HSPAs) present in the saliva⁶ are known to perform defence functions by binding to several cariogenic bacteria. These chaperones also tend to attach themselves onto the hydroxyapatite crystals of the tooth surface. They have also been shown to perform a role in the acquired pellicle formation, and subsequent drop in critical pH which inhibits bacterial colonisation.^{7,8} Considering its role in the oral defence mechanism, in the present study we analysed the levels of HSP in early childhood caries patients before and after caries control. The study groups selected for our study were mild to moderate ECC and severe ECC or (S-ECC). This grouping provided an insight into not only the variation

of expression of Hsp70 levels in relation to severity of carious lesions (intergroup comparisons), but also the effect of caries control protocol on Hsp70 on intra group comparison.

Considering the caries control protocol, time required for stabilization of oral biofilm following restorative procedures⁹ and duration of time for setting in of new routines in oral hygiene practices, a post treatment follow-up time period of 21 days was adopted. This is in accordance with observations made by Marsh PD,¹⁰ Van Der Hoeven JS et al.,¹¹ and Winnier JJ et al.¹²

Saliva was collected only once for the control group samples with good oral hygiene, since our aim was to establish a reference range for comparison of Hsp70 levels in this age group. The pre-treatment saliva samples of the drop-outs were discarded. Data was tabulated with the estimated salivary Hsp70 levels in those patients who complied and completed the caries control protocol

set out for the study. The dropout rates in the study were 18.7% in the mild to moderate ECC group and 70.8% in severe ECC group. This observation is in line with previous literature where it has been documented that parental avoidance behavior¹³ and lack of understanding the seriousness of dental caries implications on general health and well-being on the child¹⁴ plays a major in continued severity of ECC.

The mean salivary Hsp70 levels in the control group was 5988.88 pg/ml. This value is comparable to the serum Hsp70 levels obtained in adults in a study by (Hegde MN et al). However, the baseline pre-treatment values in both our study groups with dental caries significantly were lower than those of the control group ($p=0.001$) [Table 1]. This is in contrast to the observations made by (Hegde MN et al), where the Hsp70 levels in saliva were significantly greater in adults with poor oral hygiene. However, the measured salivary Hsp70 values were comparable between the control and S- ECC in the pre-treatment saliva samples ($p=0.999$). The possible rationale behind the observations remain unclear due to lack of substantial evidence in literature.

Similar observations were also made between the control and post-treatment salivary Hsp70 levels in the study groups ($p<0.001$). Pairwise post-hoc comparison using Tukey test showed statistically significant decrease in the salivary Hsp70 levels from control to ECC ($p<0.001$) and from control to S-ECC ($p=0.001$) as well. However, there was an increase in the mean post-treatment salivary Hsp70 estimations from ECC to S-ECC study samples, which was not statistically significant. These observations are contrary to the expected trend and as in the inter-group comparisons using the pre-treatment salivary samples, the possible rationale behind them remain elusive. We hypothesize based on the conclusions made by Fabian T.K. et al¹⁵ that the role of these molecular chaperones under pathological conditions are “Janus-faced”. This further adds to the evidentiary base that ECC by itself should be viewed as a pathologic condition that is predisposed by dietary, nutritional, environmental and microbiologic mechanisms already established in literature.^{16,18}

The estimation of Hsp70 molecular chaperones was also expected to throw light on the efficacy of the caries control protocol adopted in our study. Intra-group

comparison using salivary Hsp70 yielded statistically significant reduction from pre- treatment to post-treatment intervals in ECC study groups ($p=0.007$) (Table 3) This reduction was more statistically significant in the S-ECC study group ($p<0.001$) as compared to mild to moderate ECC group. These trends are in line with the prognostic role of HSPAs suggested by Tavassol F. et al¹⁷, considering the increased severity of dental disease in the S-ECC group.

Our study involved the children with early childhood caries whose caries activity was the only variable considered to create a change in Hsp70 expression, while other stresses can also induce the same. it would have been beneficial to re-assess the Hsp70 levels in saliva of control subjects after the 21-day follow up period set for this study. This would have provided better reference for the variability that should be accounted for in healthy controls with no apparent dental disease as Hsp70 levels are prone to changes due to any stress that the body encounters

With the available evidence and the results obtained in our study, it is safe to assume that the levels of salivary Hsp70 can be used as an indicator for dental treatment prognosis and evaluation of efficacy of newer treatment protocols in children. However, its role in disease etiopathogenesis remains unclear.

Ethical Clearance – Attached with email

Source of Funding – Self

Conflict of Interest- Nil

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Pre-Processing and Image Segmentation Techniques

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Abstract

Image are known as image analysis. First step in image analysis is to segment an image. Image segmentation is a key step for partitioning an image into several segments to find objects, borders & meaningful objects for an image. In image processing for any application when the work is done on an image, the initial step is to divide the image in order to solve the difficulty. Divided images are widely used in a multitude of different applications like density of tissue volumes, pathology, Satellite imaging, Extracting features & recognizing objects, treatment planning & few computer integrated surgeries etc.

This paper gives an overview of different image pre-processing techniques & image segmentation techniques. Before we do segmentation of an image, we need to pre-process an image to **remove noise**.

Index Terms— *Image segmentation, Pre-processing technique, image analysis,*

Introduction

Digital image processing is common subject in today's period. Digital image processing basically refers to processing of 2-D picture by digital computer. Sujatasaini et.al.^[8] Proposed, several image segmentation Techniques, significantly on edge-based and region- based segmentation. Segmentation action means segmenting image into parts that relate different parts of object. Each pixel in an image is given a number from the below categories.

Well quality segmentation has, Pixels in the same classification are of same grayscale of different values & shape a related area. Adjacent pixels in complicated groups have dissimilar values^[14].

If the segmentation component procedure had done well, then all other stages in the analysis of the image becomes simple.

Image Segmentation is separated into two forms, specifically considering the properties of an image^[8].

Discontinuity method: Approach of this method is, image is separated focused on few sudden variations depending on the intensity level of images. The key highlighting in the approach is to distinguish isolated points, lines and edges in image.

Similarity based method: In this approach, Principle is focused on partitioning an image into related regions based on set of prewritten rule (on similarity). Types of methods are

Thresholding

Region growing

Region splitting & merging

Clustering

Procedure in this method is, image is divided into set of groups having similar features based on some predefined rule^[6].

Method

Pre-processing methods

Pre-processing an image spots at selectively removing the redundancy present in the captured images without affecting the overall process^[7].

Steps in Pre-Processing

Image Resizing

This is done by performing the process of interpolation. It is a process which re-samples the image

to determine values between defined pixels. Thus, resized image consists more (or) less pixels contrast to original image. The intensity values of added pixels are obtained through interpolation if resolution of image is increased.

Filtering

Due to the movement of camera some disturbances are created in the image such as random image noise, intensity non-uniformity traces.

Low pass Filtering

LPF resists the edge and sharp details in an image. They are achieved by placing the rate of each pixel in an image with neighborhood mean of gray levels identified by filter mask.

By employing linear low pass filter, the edges are not maintained, but noise reduction is achieved by blurring an image, which results in loss of fine details. Filter mask used for LPF is

1/9

1	1	1
1	1	1
1	1	1

LPF Mask

High Pass Filter

Purpose of HPF is to restrict the slowly varying characteristics like background and sharp details. This filter mask includes negative coefficients at the center and positive coefficients in the outer part. Sum of entire coefficients in HPF mask is '0'. Mask for HPF is

1	1	1
1	-8	1
1	1	1

HPF Mask

When the above mask passes over a constant (or) slowly varying region, output is '0' (or) very small. Result of this is an edge enhanced image over a dark background.

Detection of discontinuities in a digital image

Point Detection

Finding of isolated points in image due to noise is done by the following mask.

-1	-1	-1
-1	8	-1
-1	-1	-1

Mask for point detection

When the above mask is placed on an image it covers 9 pixels in an image. Average response of the mask is calculated as

$$R = \frac{1}{9} [W_1Z_1 + W_2Z_2 + \dots + W_9Z_9]$$

$$= \frac{1}{9} \sum_{i=1}^9 W_i Z_i$$

Where W_i = coefficient in the mask

Z_i = gray level value of pixel in the image under

-1	2	-1
-1	2	-1
-1	2	-1

Vertical Mask

-1	-1	-1
2	2	2
-1	-1	-1

Horizontal Mask

-1	-1	2
-1	2	-1
2	-1	-1

+45° Slanting line

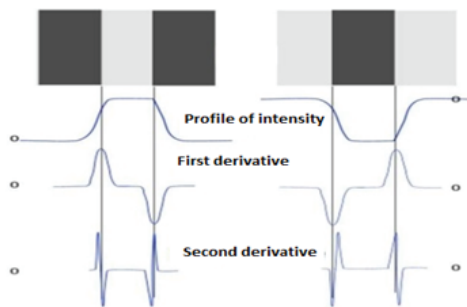
2	-1	-1
-1	2	-1
-1	-1	2

-45° Slanting line

If the horizontal mask is shifted around an image, the response value is larger to lines that are oriented horizontally. If all the masks are applied to an image and the responses calculated are denoted as R_1, R_2, R_3 and R_4 For all $j \neq i$, at some point, the particular point is additional accurately connected with the line in the path of mask.

Edge Detection

Edges located as considerable local distortions in the intensity of an image. They occur on the borderline in the middle of two different portions in image. The result of edge detection is to know main types like corners, lines and curves in image. Intensity changes in an image are due to assorted material events.



Dark Background having Light Stripe **Light Background having Dark Stripe**

Fig: 1. Detection of edges using derivatives.

Gray level sketch is negative at the foremost edge of the change, positive at the trailing edge and zero in the area of constant gray area in first derivative.

For the part of the change associated with the light side of the edge, the second derivative is negative, positive for the portion of the transition in cooperated along the dark side of the edge and zero for pixels lying exactly at the bottom.

On observation the first derivative calculation is used to detect the presence of edge in the image and second derivative shows whether the edge pixel are positioned along dark side (or) light side of the edge .

Edge detection with Gradient Operator

Gradient is a vector that has certain magnitude and direction. It is measurement of change in image function

$f(x,y)$ in X(across/columns) and Y (down/rows). This is the first derivative for enhancement of an image. Gradient operator is represented as

$$\nabla f = \begin{pmatrix} G_x \\ G_y \end{pmatrix} = \begin{pmatrix} \frac{\partial f}{\partial x} \\ \frac{\partial f}{\partial y} \end{pmatrix}$$

$$\text{Mag} (\nabla f) = [G_x^2 + G_y^2]^{1/2}$$

$$\text{Dir} (\nabla f) = \tan^{-1} (G_y/G_x)$$

Angle relative to x-axis is measured

The direction of an edge at (x, y) is at right angles to the gradient vector direction at the particular point.

Robert Cross-Gradient operator

In [1] it is proposed that Robert is 2-D mask which can be used when there is a need of diagonal edge direction.

$$G_x = \frac{\partial f(x,y)}{\partial x} = W_9 - W_5$$

$$G_y = \frac{\partial f(x,y)}{\partial y} = W_8 - W_6$$

W_1	W_2	W_3
W_4	W_5	W_6
W_7	W_8	W_9

3X3 Image Region

-1	0	0	1
0	1	-1	0

Roberts Cross Masks [1]

Roberts Cross Masks [1]

Edge detection using Prewitt operator

For edge detection Prewitt is used which can be also called as discrete differentiation operator. It finds two types of edges.

- a) Horizontal edges
- b) Vertical edges

Masks for edge detection are well-known as derivative masks. Derivatives masks should have the following properties.

- 1) Inside the mask will be opposite symbol
- 2) Size of mask is zero
- 3) Higher value means better edge detection

-1	0	1
-1	0	1
-1	0	1

Vertical Direction Mask

The above mask finds the edges in vertical direction and it is because of the zero columns in the vertical direction, when we convolve mask on an image, it will give vertical edges in an image.

Working Procedure

By adding to an image this mask highlights the vertical edges. It just functions like the first derivative and measures the pixel intensity difference in an edge field. As the middle column is zero it will not be the original value of the image, but the difference between the right and left pixel values around the edge is calculated.

Horizontal Direction Mask

The mask shown above will find edges in horizontal direction. Due to the presence of these zero columns in horizontal direction, when convolving the above horizontal mask onto image given, it tells us horizontal edges in image.

-1	-1	-1
-1	8	-1
-1	-1	-1

Sobel operator

This is same as prewitt operator, can be called as derivative mask and the purpose is for edge detection. For prewitt’s operator the response to diagonal elements is weak but it is not so weak for sobel operator since it gives better weights to the points nearer to the point (x,y) which we had considered^[12]. A Sobel operator provides both differencing and smoothing effect

1	2	1
0	0	0
-1	-2	-1

Mask for computing G_x

Component using sobel operator

-1	0	1
-2	0	2
-1	0	1

Mask for computing G_y

Component using sobel operator

$$G_x = (W_7+2W_8+W_9) - (W_1+2W_2+W_3)$$

$$G_y = (W_3+2W_6+W_9) - (W_1+2W_4+W_7)$$

Where W’s are the gray pixels rates of covered by the masks at any position in image.

Laplacian operator

The former operators are named the first difference operator. Laplacian then again, is a second differential operator ^[12]. Laplacian operator is given by

$$\nabla^2 f = \frac{\partial^2 f}{\partial^2 x} + \frac{\partial^2 f}{\partial^2 y}$$

$$\nabla^2 f = 4W_5 - (W_2 + W_4 + W_6 + W_8)$$

For a 3X3 mask, regularly used practice is

0	-1	0
-1	4	-1
0	-1	0

Laplacian Operator

The vital necessity in identifying the Laplacian

is, it knows about coefficient presence .Presence of coefficient related with the center pixel is positive and the coefficient related with the external pixel is negative. Kernel that are regularly utilized are

-1	-1	-1
-1	8	-1
-1	-1	-1

Laplacian Operator

With diagonal components

Region-based segmentation

Edges based method searches the object borders and then locate the object itself by packing them in. This region based technique is a reverse approach it starts in the image and starts expanding outward until it go off to the object boundaries. Two strategies are explained under this Region-based segmentation.

- 1) Region Growing
- 2) Region splitting and merging

Region Growing

This method gives explanation about pixels which are close together which have comparative gray level values.

Procedure: This approach develops the information that pixels which are close together have similar gray values [6][9].

Procedure begins with a single (seed) & adds new pixels slowly

- 1. Select pixels for seed.
- 2. Find neighboring pixels which are very similar to the seed and add them
- 3. Continue with the step 2 for every recently new pixels and conclude the method if no further pixels are

added.

Region splitting & Merging

The Procedure for this method is to partition the image initially into random collection; unconnected areas until the region become small enough for segmentation. Region splitting & merging visually is executed using the theory based on quad-tree data.

Following diagram shows division based on quad tree.

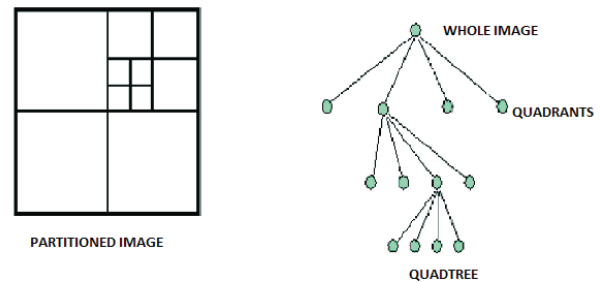


Fig: 2 Division of region w.r.to quad tree

Steps for region splitting and merging are.

Let A signify complete region of image & pick a predicate P.

- 1. Each region is divided into four disjoint quadrant which satisfy the condition $P(A_i) = \text{false}$.
- 2. Join any adjacent regions A_j & A_k which follows

$$P(A_j \& A_k) = \text{true}.$$

- 3. Stop the method if no more merging or splitting is likely to happen.

Conclusion

Various segmentation methods are mentioned in this paper. These techniques can be used in different fields like restorative picture applications, for object recognition & detection. Depending on the application, distinctive segmentation strategy can be selected.

Ethical Clearance: Clearance taken from the DIRECTOR , R & D cell, Hindu College of Engineering & Technology , members to publish this work .

Source of Funding : Self

Conflict of Interest : I am the only author & I don't has any conflicts in the subject matter (or) materials discussed in this manuscript

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Cryotherapy in Knee Osteoarthritis

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Abstract

Knee osteoarthritis (OA) is the most common chronic musculoskeletal disorder characterized by pain and disability. It is the most common form of degenerative joint condition that affects synovial joints and does not cause any systemic involvement. It is an inflammatory and degenerative disorder which leads to joint cartilage destruction and ultimately joint deformity. The treatment aims to decrease the presenting symptoms of the disease leading to slow down the progress of the disease. Various treatment options are available for the treatment of OA that includes superficial heat or cold, obesity control, physical exercises and medications. Cryotherapy which is a non-invasive treatment option is widely used in various musculoskeletal disorders to control pain, inflammation and oedema. It is a safe and inexpensive treatment option that can be used alone or in conjunction with available treatment options. This article intends to focus on the role of cryotherapy in Knee Osteoarthritis.

Keywords- Cryotherapy, osteoarthritis, heat therapy

Introduction

Osteoarthritis is the most prevalent musculoskeletal degenerative disease that affects synovial joints¹ without causing any systemic involvement and associated mortality². OA knee is an inflammatory disorder that causes degeneration and destruction of joint cartilage ultimately leading to deformity of joint³. Approximately, 6% of adult population suffers from knee osteoarthritis and their prevalence increases with each and every decade of life.⁴ Lawrence et al⁴ demonstrated that the estimates of knee OA (symptomatic and radiographically) in 45 years and older is 16.7%³ having more women's ratio than men's ratio⁴. Pain is the first presenting symptom, subsequently leading to joint changes and progressive decreased function¹. With the progression of OA, pain becomes continuous in nature, with severe impairment of the affected joint⁵. Patients often complain of tenderness, joint stiffness, muscle weakness, limited joint range of motion, crepitus, osteophytes, deformity, impaired proprioception and disability. Because of the joint instability & weakness of thigh muscles, patients may experience serious effect on ADL's^{6, 7}. The mechanism of OA and its progression in the joint is not completely unknown because of which, it is not a curable disorder. Various options of treatment are available for

OA including superficial heat or cold, obesity control, physical exercises, medications, corticosteroids and joint replacement⁹. Among different physical agents, this study focuses on the cryotherapy. Cryotherapy is a non invasive treatment commonly used in different musculoskeletal disorders to control pain, inflammation and oedema^{10, 11, 12}. It is an inexpensive, easy to use and relatively safe method both for the patients and medical professionals. It can be used alone or in association with other available treatment options^{11, 13, 14}. Various international guidelines also recommend that cryotherapy is a treatment option for Knee OA^{15, 16}. There are certain risks/ADRs associated with drug therapy & surgical treatment but there are no side effects associated with superficial heat or cold therapy^{17, 18}. In spite of limited knowledge about the heat therapy, cryotherapy or contrast therapy for the treatment of knee OA, superficial heat or cold is most commonly used as "first-line" treatment option for the treatment of knee pain^{5, 19}. Porcheret et al¹⁹ investigated approx 201 patients with older knee pain. Out of which, about 84% of patients were reported to take superficial heat therapy or cryotherapy, as a self-started treatment option. Cetin et al⁴ found that the cryotherapy or superficial heat can be used with TENS, diathermy or ultrasound that leads

to symptomatic relief and functional improvement in patients of OA knee. It is found to be very helpful in improving patient's physical activity level, decreasing fatigue in patients.

Objective

The current study focuses on the role of cryotherapy in knee osteoarthritis.

Methodology

A comprehensive computerized search performed on google scholar, pubmed etc.

(Publication from 2007-2019) is used.

Search strategy

Knee osteoarthritis

Cryotherapy

Mechanism of action of cryotherapy

Cryotherapy acts by lowering the tissue temperature to achieve an analgesic effect by withdrawing heat from the body (Knight, 1995). Cryotherapy is used to reduce swelling and inflammation and to relieve spasm in clinical practices (Bleakley, 2004). Cold therapy influences the proprioceptive receptors located in the soft tissues and It is recommended that if cryotherapy influences the proprioception of body, then use of cold can also influence the receptors of both muscle spindles and Golgi tendon organs (GTO) that affects the muscle length and muscle tension respectively (Proske, 2005; Proske and Gandevia, 2012).

Different modes/methods of cryotherapy

Cold therapy includes whole body therapy (dry air with temperature ranges between -80°C to -110°C for about 1–3 min), ice packs or cold gel packs application, cold-water immersion (CWI), other local or general cold application or ice massage used for therapeutic purposes²⁰. From the different modes of cryotherapy, CWI is the most popular method used in clinical practices²¹. Various studies have investigated²²⁻²⁸ and reviewed²⁹⁻³³ the effects of cold water immersion technique for decreasing the muscle soreness and for speeding up the recovery of skeletal muscles. However, the evidence regarding the cold water immersion

and the cold therapy in general, for speeding up the recovery of skeletal muscles remains equivocal. In metabolically stressful activities, cold therapy helps to decrease hypoxic stress, reduce the reactive oxygen species (ROS) generation and subsequent damages³⁵⁻³⁶. It also decreases oedema and soreness by inducing vasoconstriction^{34, 37, 38}, decreases exercise induced metabolic stress locally in skeletal muscles leading to high rate aerobic energy transformation and heat generation^{39,40} by decreasing intramuscular temperature and metabolism³⁴. All these factors lead to an increase in generation of reactive oxygen species (ROS), that are highly reactive in nature and that denatures the nucleic acid structure, lipids and proteins, leading to alteration in the muscle cell structures including both sarcolemma⁴¹ and the excitation–contraction coupling system⁴². Due to the damage, this coupling system impairs the kinetics of contraction, while alteration in sarcolemma makes the muscle fibres more permeable and more prone to injuries⁴³. Cold therapy can act as a temporary analgesic^{20,33,44-46}. Because of anti-inflammatory effect, cryotherapy can reduce the stimulus that initiates the pathways that causes secondary muscle damage^{36,46}.

Summary of included study's characteristics

Adriana Lucia Pastore Silva, Daniela Mayumi Imoto, Alberto Tesconi Croci (2007) studied Comparison of cryotherapy, exercise and short waves in treatment of OA knee. The aim of this study was to compare the physical exercise, cold therapy and short waves in patients. And found that **the ice and kinesiotherapy was the most appropriate intervention options for the relief of pain.**⁴⁷

Carolina Carreira Breda, Lucas Ogura Dantas et al (2019) studied that Short-term cryotherapy did not substantially reduce pain and had unclear effects on physical function and quality of life in people with knee osteoarthritis: a randomised trial. The study included various RCTs with enshrouded allotment and blinded assessment of outcome variables. Cryotherapy was used as crushed ice packs with slight compression to the knee for experimental group. The control group received sham packs that were filled with sand. The result suggested that cryotherapy was not better intervention than sham for relieving the pain or for improving function and QOL in patients with knee. Although, in clinical practice

cryotherapy is considered as a commonly used treatment option.⁴⁸

Craig R Denegar, Devon R Dougherty et.al (2010) studied, Preferences for heat, cold or contrast in patients with knee osteoarthritis affect treatment response. The study checked the effectiveness for superficial heat, cold, or contrast therapy in knee osteoarthritic patients. The study found that superficial heat or cold provides greatest relief and after that contrast is also treatment option⁴⁹.

Tomasz Chruściak (2016) studied, Subjective evaluation of the effectiveness of whole-body cryotherapy in patients with osteoarthritis. The study was done to investigate the effect of whole-body cryotherapy in osteoarthritis. The result of the study suggested that the Whole-body cryotherapy plays important role in relieving both degree and frequency of pain in patients.⁵⁰

Manal E. Fareed and Amal E. Shehata (2013) studied, Effect of Cold, Warm or Contrast Therapy on Controlling Knee Osteoarthritis Associated Problems. This study investigated the Comparative effect of cryotherapy, heat therapy and contrast therapy in decreasing problems with knee OA and the result of study suggested that all the methods of therapy for knee pain results in improvement of pain and symptoms but the most acceptable method of therapy for symptomatic relief is contrast therapy⁵¹.

Mariusz P. Furmanek, Andrzej Sobiesiak, Kajetan J. Słomka1, et al (2018) studied, The Effects of Cryotherapy on Knee Joint Position Sense and Force Production Sense in Healthy Individuals. The study aimed to check the effectiveness of local cryotherapy on the force production sense (FPS) and knee joint position sense (JPS). The results of the study recommend that local cold therapy does not affect proprioception of healthy knee joint⁵².

Discussion

The objective of the study was to reveal the role of cryotherapy in OA knee. The timely application of both superficial heat therapy and cryotherapy is quite safe treatment option. There are only few studies that demonstrate whether superficial cold, heat or contrast therapy are better options to control osteoarthritis¹¹.

In spite of limited knowledge about the effect of heat, cold or contrast modalities in the treatment of knee OA, superficial cold or heat is frequently used, and is assumed as “first-line” treatment option for the treatment of knee pain.^{8,9} Additionally, Cetin et al⁸ found that the application of cold or superficial heat in combination with SWD, TENS or ultrasound results in both symptomatic relief and functional improvements in individuals with osteoarthritis.

Conclusion

Cryotherapy (cold therapy) is a non-invasive intervention which is commonly used in several musculoskeletal disorders for decreasing pain, inflammation and oedema¹⁰⁻¹². It is assumed as inexpensive, safe and easy to use method for both medical professionals and for patients. Cryotherapy can be used alone or in conjunction with various therapies^{11,13,14}. Warren et al. (2004) suggested that after 30 min of cryotherapy application (crushed ice) intra-articular temperature of patient is reduced by 3.3°C, whereas surface temperature of patient's body is decreased upto 21.4°C. Myrer et al. (1998) suggested that after 20-min of treatment with cryo (crushed ice) there is reduction in the intramuscular temperature by 7.1 ± 4.1°C. The above investigations resulted that cryotherapy was effective to provide coolness to both the muscles and the knee joint.

Source of Funding-Nil

Ethical Clearance-Not been taken

Conflict of Interest

Authors declare no conflict of interest in relation to this paper.

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Assessment of the Prevalence of Kidney Stone Disease: A Structural Equation Model

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Abstract

Background : This study entitled “Assessment of the Prevalence of Kidney Stone Disease: A Structural Equation Model” deals with the Kidney stones are of many types and have many causes, treatment depends on the size, nature and cause of the stone. Calcium and Oxalate stones are the most common varieties. Changes in the daily intake of Sodium, Protein, Calcium, Oxalate and fluid will slow stone formation. Dietary restrictions slow but do not cure kidney stones.

Materials and Method : A retrospective cross-sectional study design was conducted. In this study, we have discussed the detection of kidney stones using structural equation modeling (SEM).

Results : In general, structural equation models with scores for these measures of 0.9 or above are considered to have acceptable model fit and RMSEA is also a very popular measures this value is 0.19. This value indicates a not good model fit.

Conclusion : There is strong evidence that there is no association between stone size, age, sex, height, BMI, and hydronephrosis.

Keywords : *Structural equation modeling (SEM), Confirmatory factor analysis (CFA), Patients with Kidney stone disease, Stone size and Demographic variables.*

Introduction

Kidney stones are one of the everyday problems people face. Increasing the prevalence of Chronic Kidney Disease (CKD) is an important public health problem, especially for the elderly. The burden of CKD is severe in terms of medical costs and shortened health care, and people with CKD are at increased risk of end-stage kidney disease, cardiovascular disease, and premature death^{1,2}. Kidney stone disease is a devastating disease, with recurring pain episodes, surgical intervention, drug use and risk of side effects, all of which affect the quality of life of patients³. Early detection of decreased renal function can help prevent kidney disease from progressing to kidney failure, cardiovascular events, and early death^{4,5}. Although CKD risk factors such as poorly controlled diabetes mellitus and hypertension are well established, efforts to reduce these risk factors alone have not yet led to a reduction in the prevalence of CKD⁶.

Nearly 12 percent of our country suffers from kidney stone damage. There are two reasons why stones come in the kidneys. One comes from outside. This includes factors such as food, drinking water, and lifestyle. Another is the damage to the body. Children are often affected in this manner. That is, the heredity of the genus is kidney stones. The lack of adequate water is the main reason for the formation of kidney stones. Excess calcium, uric acid, oxalate, phosphate nutrients excretion in urine. It is necessary to dissolve them in liquid form and drink enough water to get rid of the urine. Otherwise, excreting calcium, uric acid, oxalate salts in the urine will be completely dissolved in liquid water and stay on the urine track. Then it will grow into a kidney stone.

A kidney can also be affected either at the same time or at both kidneys. These can come in many different sizes and different forms. There are 5 types of kidney stones. First type of calcium phosphate Oxalate type

stones. This type of stones is mostly formed by people over the age of 30. More than 60 percent of kidney stones are affected by this type of stone. The main reason is the excess of calcium nutrients in the urine. This means that more calcium supplements, high Vitamin D pills, stoic drugs, more nutritious food consumers, lactic drinkers and calcium-rich water are not affected by this type of stones. Once these stones come once again in 2 or 3 years, there is a chance to be back again. About 60 per cent of these people have a problem. By the end of the year they are also broken by the stones on the kidney path, and there is a risk of permanent kidney failure due to infection. Citric acid has the power to prevent such stones. Lemon and orange juice help prevent kidney stones. The following can be said of uric acid stones in the order of impact. This impact cannot be detected by an image. Ultra-scan or CT scan can only be found. This impact will be easier for mobile lovers. Uric acid stones are at risk for damaging the urine, especially the liver and the brain. Some medications, pillars and uric acid gems come. Even some people have inherited this disease. 3rd Type Oxalate Stones. Adding some of the ingredients like tomatoes, spinach leaves, chocolate, drinking tea, cashews, almonds, and pistachios can also cause this effect. 4th type Sistine stones. This is often the impact of children. Or maybe descending. Adults rarely occur. 5th Stones Invention Stone, which comes from urinary tract infection. This is a very hazardous. Because of this damage there is a risk of permanent kidney failure. These stones can also come back to the urinary tract infected. Therefore, urine should not be ignored.

It is important to investigate the long-term follow-up of disease rather than kidney disease and cross-sectional studies as a potential risk factor for kidney disease. Such insights will lead to new strategies to prevent the development of kidney disease. Therefore, the purpose of this longitudinal study was to investigate whether stone size, age, sex, height, BMI and hydronephrosis are a risk factor for decreased renal function ⁴.

Materials and Method

Subject and methods

A retrospective cross-sectional study design was conducted. This study population includes all patients who have been diagnosed with kidney stones in the medical

records of the tertiary care center of Vedanayagam Hospital, RS Puram, Coimbatore. In order to quantify the prevalence of kidney stones among patients admitted to Vedanayagam Hospital, steps were taken to collect a random sample from them and to differentiate between patients with kidney stones and those without kidney stones. The present study uses a 95% confidence level with an acceptable error of 1% ³.

Study population

A hospital-based observational study was conducted during August 2017–August 2018 in Coimbatore district of Tamil Nadu state, India. Coimbatore is the largest district of Tamil Nadu with an approximate population of 15.1 lakhs. The city is famous for medical tourism because of its wide network of cost-effective tertiary-care hospitals catering to the need of population of not only from Tamil Nadu but also from neighboring states and even from abroad.

Sample size

A sample-size of 150 was decided on the basis of review of data of the Department of Urologist which revealed that at least 23 subjects (newly diagnosed) were presented every month.

Study limitation

The limitation of the study was due to relatively small sample size. Although the minimum sample size of the proposed model is satisfied, the structural equation requires at least 150 samples to make the sample size reliable in the model. With a sufficient sample size, the mediation effect may be apparent by the structural equation model of relationships between the variables ⁷.

Data Analysis

The quantitative data analysis process includes an analysis of the descriptive statistics using the SPSS AMOS statistical program (Statistical Package for the social Sciences for Windows (student version)) to describe the general information. Furthermore, the SEM models of general public services in Coimbatore district were assessed using a continuity measurement index and empirical data. Therefore, we used structural equation modeling to test our

hypothesis model, using data from patients with kidney stone disease Vedanayagam Hospital in Coimbatore district ⁸.

Statistical Analysis

Frequency analysis

A frequency is used for looking at detailed information on nominal (category) data and describing the results. Frequencies options include a table 1 showing counts and percentages.

Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) is a multivariate analysis technique. It is used to estimate

simultaneous multiple hypothesis relationships between latent variables (or underlying constructs) and observable variables ⁹. This study used a cross-sectional design and structural equation modeling (SEM) to analyze the relationships between the variables ¹⁰ related to the patients with kidney stone disease. The model was evaluated using several criteria: χ^2/χ^2 value indicating the probability was <0.05 significance, Goodness-of-Fit Index (GFI) greater than 0.90, Comparative-Fit Index (CFI) greater than 0.90, Normed-Fit Index (NFI) greater than 0.90, and Root Mean Square Error of Approximation (RMSEA) less than 0.08 ¹¹⁻²⁵. The conceptual model specifying the relationships between the concepts that are employed in this study (numbered) can be seen in Fig.1. As a precursor, we predicted 4 pathways that directly and / or indirectly affect the kidney, emerging from stone size variable ⁸.

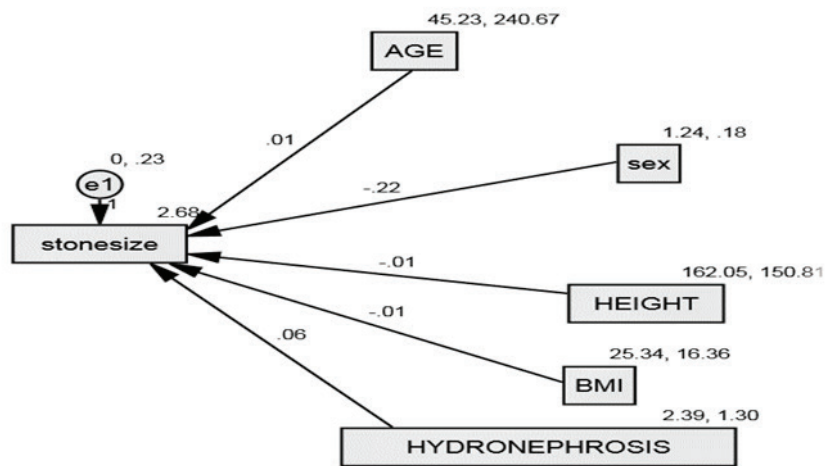


Fig. 1 Association between Stone size and demographic variables: Best-fitting model with pathways and standardized estimates

Results and Discussion

Table 1 Frequency analysis for Demographic variables

Gender	Frequency	Percent
Male	114	76.0
Female	36	24.0
Total	150	100.0
Weight	Frequency	Percent

Cont... Table 1 Frequency analysis for Demographic variables

10-20	2	1.3
21-40	2	1.3
41-60	33	22.0
above 60	113	75.3
Total	150	100.0
Height	Frequency	Percent
80-100	2	1.3
121-140	1	.7
141-160	48	32.0
161-180	98	65.3
above 180	1	.7
Total	150	100.0

Information on socio-demographics including gender, weight, and height should be concise³. Table 1, shows that it can be seen that 76% of the respondents are male and 24% of the respondents are female, it can be seen that 1.3% of the respondents are 10-20, 1.3% of the respondents are 21-40, 22% of the respondents are 41-60 and 75.3% of the respondents are above 60, and 1.3% of the respondents are 80-100, 0.7% of the respondents are 121-140, 32% of the respondents are 141-160, 65.3% of the respondents are 161-180 and 0.7% of the respondents are above 180.

Table 2 H₀: There is no association between stone size and demographic variables

CMIN					
Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	17	67.063	10	.000	6.706
Saturated model	27	.000	0		
Independence model	12	85.519	15	.000	5.701
Baseline Comparisons					
Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.216	-.176	.244	-.214	.191
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Cont... Table 2 H₀: There is no association between stone size and demographic variables

FMIN				
Model	FMIN	F0	LO 90	HI 90
Default model	.450	.383	.234	.583
Saturated model	.000	.000	.000	.000
Independence model	.574	.473	.303	.694
RMSEA				
Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.196	.153	.241	.000
Independence model	.178	.142	.215	.000
HOELTER				
Model	HOELTER		HOELTER	
	.05		.01	
Default model	41		52	
Independence model	44		54	

Table 2, shows that more popular measures of model fit include the not significance level of our chi-square value, the ratio of chi-square divided by its degrees of freedom (CMIN/DF), NFI (Normed Fit Index) and CFI (comparative fit index), RMSEA (Root Mean Square Error of Approximation) and Hoelter's critical N. So, it would not be considered to have good model fit using this measure. Next, NFI and CFI are popular measures of model fit. Both of these measures range on scale from 0 to 1. Both NFI and CFI were 0.21 and 0.19 respectively. In general models with scores for these measures of 0.9 or above are considered to have acceptable model fit and RMSEA is also a very popular measures this value is 0.19. This value indicates a not good model fit.

Conclusion

Fig.1 shows that, it infers that there is strong evidence that there is no association between stone size, demographic variables.

Kidney stones can be formed by precipitation or crystallization of minerals and urine components. This is a common problem worldwide, manifested by a series of intermittent pain episodes, surgical interventions, and medication

consumption affecting patients' quality of life³. The present evidence strongly concludes that the variables taken in this study had no association between age, sex, height, BMI, hydronephrosis and the size of the stones. The study also considers that kidney stones may come in some other way.

Acknowledgement: We are grateful to the study participants for their cooperation and participation. We thank P. Manigandan, D. Pachiyappan, K. Prema, P. Yalni and S. Vijayan for their help in data collection. We also thank Dr. K. Alagirisamy for the contributions for the preparation of the study.

Contributorship statement K. Lokesh designed the study, carried out the study, analyzed the results, and contributed to the discussion of results and drafting of the manuscript. Dr. K. Alagirisamy contributed to designing the study and discussion of results, and the final manuscript. All authors have read and approved the final manuscript.

Funding This work received no specific grant from any funding agency in the public, commercial or non-profit sectors.

Compliance with ethical standards

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent Before any study-related activity, eligible patients were provided with oral and written study information, and their informed consent was obtained.

Competing interests The authors declare that they have no competing interests.

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Comparison of Application of Bio-Statistics in National and International Medical Journals

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Abstract

Bio-statistical methods are increasingly used in the medical research for designing, presentation and analysis of current medical research. The objectives of present study are to compare application of Bio-statistical methods used in medical research in National and International Journals. Study method is by reviewing the current medical journals both National and International, which are received at the Medical college Library of Vijayanagara Institute of Medical science. The more common methods of Bio-statistics used in designing, presentation, and analysis is compared among different specialties of Medical research both in National as well as International journals. The study is helpful for the Bio-Statisticians in selection of proper Bio-Statistical methods for medical research and is also helpful for the medical researchers to know the current methods of Bio-Statistics for data presentation, analysis and interpretation.

Keywords: *Medical research, National medical journal, International medical journal, Study design, Study presentation, Study analysis, Biostatistics.*

Introduction

Lifelong learning as a physician demands facility in the assessment and application of clinical evidence from medical literature. Appraised of an articles methodological rigor depends on an understanding of the study design and analysis used by the author^[1].

The accreditation council for Graduate medical education and American Board of Pediatrics mandate that to attain competency in practice based learning and improvement, residents are expected to apply knowledge of study design and statistical methods to the appraisal of clinical studies and to appraise and assimilate evidence from scientific studies related to their patient health problem^[2].

It is also not clear which statistical concepts are most necessary and useful for readers to become familiar with. There has been a well documented trend towards the use of new and increasingly complex statistical techniques in published article^[3].

An earlier study demonstrated that reader of Pediatrics who understood descriptive statistics (for

example Means and SD) and three inferential statistical procedure (student t-test, chi-square test, Pearson's r) could understand the statistical analysis in 97% of research article published in 1952 but only in 49% of article in 1982^[4].

The present study is relating to the Bio-Statistical methods used In Medical research both in National as well as International Medical journals.

Objectives:

1. Comparing the National Medical journals and International Medical journals for their use of Bio-statistical methods in the Medical research.
2. To study the Bio-statistical methods that are currently at use in Medical research both in National and International Medical journals.

METHODS:

This study is based on the review of articles published in the National and International journals which are received at the medical college library. Minimum of one article is selected which used Bio-statistical method in

their study. All the journals were published in the year 2007 except few which are published in the year 2006.

All together there were 85 article from Indian Medical journals and 84 articles from International journals selected. The total number of article reviewed is 169.

In each article Bio-statistical design used, presentation of diagram graph or table, and Bio-statistical methods used for data analysis is recorded. Percentages are calculated and compared.

Results

The number of National Journals taken for study is 22 and number of International journal taken for study is 20. All together 42 journals are used for the study. Also journals represent all the distinct specialty of Medical field and 26 journal articles from National and International medical journals reviewed for the study is listed in the reference section^[5-30].

Table 1 below lists the Sampling Designs that are used by the study.

Table 1: Sampling Design that are used in the study.

Sampling Design	No. in the National Journal (with %)	No in the International Journal (with %)	Total (with %)
Observational study	23 (27%)	20 (24%)	43 (25%)
Clinical Trials	16 (19%)	06 (07 %)	22 (13%)
Animal Experiment	08 (10%)	05 (06%)	13 (8%)
By reviewing the published articles	00 (00%)	04 (5%)	04 (2%)
Using sampling method study taken	02 (2%)	25 (30%)	27 (16%)
Demographic and Health survey	00 (0%)	03 (4%)	03 (2%)
Using Questionnaire	01 (1 %)	01 (1 %)	02 (1 %)
Disability Adjusted life (DALY) Years	00	01 (1 %)	01 (1 %)
Not specified	35 (41%)	19 (22%)	54 (32%)
Total	85	84	169

Sampling designs that are used in the National Medical journals shows 27% are observational studies and 19% are clinical trials. Animal experiments consists 10%. Sampling design not specified in 41 % of the articles.

Sampling designs that are used in International Medical journals shows 30% of the articles specified sampling method used in the study. 24% of them are observational study. Not specified in 22% of the article.

Of the total article 32% not specified any sampling design while 25% are observational study. Sampling methods specified in 16% of the study.

Table 2: Average no of Graphs and Table used per article.

Type	In the National Journals	In the International Journals	Total
Graph	0.94	1.52	1.23
Table	0.40	0.51	0.47

According to this table average no. of graph used per article is 0.94 in the National journals and 1.52 in the International over all 1.23 graph used in both the journals.

The average no of Table is 0.40 per article in the National journals and 0.51 in the International journals. And 0.47 tables per article when combined together.

Both average no of graph and tables are more in International journals than in National journals.

Table 3: Types of Graphs used.

Types of Graph	National journals	International journals	Total
Bar diagrams	18 (21%)	18 (21 %)	36 (21%)
Frequency Polygon	06 (7%)	02 (2%)	08 (5%)
Trend line	05 (6%)	11 (13%)	16 (9%)
Error bar	00	04 (5%)	04 (2%)
Scatter diagram	04 (5%)	07 (8%)	11 (7%)
Log LD50 Graph	00	01 (1%)	01 (0.6%)
Pie diagram	03 (4%)	00	03 (2%)
Kaplor meir survival curve	01 (1 %)	00	01 (0.6%)
Total	37 (44%)	43 (51 %)	80 (47%)

Most commonly used graphs are Bar diagram and Trend line in both National and International journals. Other types of graphs such as Scatter diagram used more in International journals than in National journals.

Table 4: Bio-statistical methods used in National Journals.

Bio- statistical methods	No. of articles (%)
Pearson chi-square test, fisher exact test, student t test, z test	57 (67.05%)
Mean + SD	39 (45.88%)
95% C.I	02 (02.35%)
ANOVA	13(15.29%)
Percentage or proportion	11 (12.94%)
Pearson correlation coefficient, Spearman rank correlation coeff	09 (10.58%)
Multiple regression analysis Multiple logistic regression analysis	08 (09.40%)
Life Table method	01 (01.17%)
Scheffe 's multiple comparison Test	07 (08.23%)
Median quartiles Geometric mean	04 (04.70%)
Mean + SEM	01 (01.17%)

By comparing the National and International journals, Pearson chi-square Test, Fisher exact test or student t test are used maximum number of times for the analysis. In the International journals 25% of tests are new methods of test of significance.

Similarly multiple regression analysis, multiple logistic regression analysis is used in 20.23% of articles in International journals but it is only 9.4% in National journals.

Use of correlation coefficient is 10.58% in National journals but it is 15.47% in International journals.

In the National journals 95% confidence interval is used in 2.35% of the articles and 19% in International journals.

Discussion

The study design is important for the reliable and valid results in the Medical research. Sampling design mentioned in 59% of National journals while in International journals it is mentioned in 78% of the

articles. In National journals 27% are of observational study followed by 19% clinical trials but in International journals sampling study is highest with 30% and next is observational study. (Refer Table-1).

Both average number of table and graph per article used by International journals is more than National journals i.e. 0.51 and 1.52 respectively. (Refer Table-2), National and International journals used Bar diagrams for presentations (21%). This is followed by Frequency polygon (7%) in National journals, and Trend line (6%) in International journals. One or the other type of graphs is used by 44% of National journals and 51% in International journals. (Refer Table-3).

Pearson chi-square test, Fisher exact test, student t-test and Z-test is used maximum number of times 67.05% in National journals and it is 32.14% in International journals.

Mean + Standard deviation are calculated for analysis in National journals by 45.88% of the articles, but it is 11.9% in International journals. ANOVA is used

in 15.29% of articles in National journals and is used in 25% of International journals.

Newer method of statistical significant test such as Bonferoni's post hoc test is used in 14.28% of International journals. Tests such as Kaplan Meir Log rank test, Kappa statistics, Students-Newmen-Keels test are used in International journals but none of these methods are used in National journals (Refer Table-4).

Regression analysis technique is used in 20.23% of research articles in International journal but it is not used in National journals. (Refer Table-4).

Conclusion

Bio-statistical methods used in International journals are more when compared to National journals. The use of these newest methods needs to be further studied for adoption in our research methods.

Familiarities of these methods are needed for both Bio-statisticians and Medical researchers. The necessity of learning biostatistics for research in Medical field is increasing. It is further required to train Bio-statisticians to use present methods which are introduced in International journals. Training has to be given to the medical persons on the usage of newer methods in Bio-Statistics.

Conflict of Interest: None Exist

Source of Funding: Self

Ethical Clearance: Ethical issue not involved

Acknowledgement: I thank Director and Principal of Medical College (VIMS) for their encouragement for the study. Also, I am very thankful to professor and HOD of department of Community Medicine and all other staff for their support.

Special thanks to Chief Librarian, Medical College Ballari for permitting me to refer journals.

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The Role of Ayurveda in Public Health

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Abstract

Ayurveda is India's traditional system of medicine. around 80% population, especially using this system of medicine for their health care management. There are many issues and concerns over the usage of Ayurveda, They are simplified and try to deal in this paper. The methodology used to complete this review was through empirical research. This is a cross-sectional study where the use of Ayurveda utilized in this current period is examined. The sources are mostly from a doctor of Ayurvedic medicine and credible online sources.

Key words: *Ayurveda, Public, health*

Introduction

Ayurveda is an alternative form of medicine that originated in India. This traditional practice is personalized to each patient and primarily uses a holistic approach.¹ Ayurveda is known for its promotive, curative, and therapeutic concepts. The main objective of Ayurvedic treatments is to promote a healthy lifestyle through proper nutrition, prevention of disease, and specialized treatments based on the diagnosis.¹ It is part of AYUSH, which stands for Ayurveda, Yoga, Unani, Siddha, and Homeopathy.² AYUSH is widely used in public health sectors within India.

From the 2013 census, India was clocked at less than one doctor working in public health for every 1,000 people, for a total population of 1.375 billion.³ The health care system is pluralistic, meaning there are options of alternative medicine and modern biomedicine.⁴ Each state in India is responsible for providing its population with health care.⁵ Indian citizens do not need to pay for health visits or medicine when visiting a public health

centre in India. Health care is distributed in a vertical system; district hospitals, urban and rural primary health centres that reach over 50,000 people each, and sub-centres with some specialists.⁶ These centres often have provisions for AYUSH care with 15 AYUSH workers per 2,000 people.⁴ It is widely understood that traditional medicine can be utilized in resource-poor settings and has the potential to make a difference in rising nations.⁴

Material and Method

Empirical, Cross-sectional study.

Discussion

Health care can be more than just one note. India is such a diversified country and consisting of a myriad of different cultures, religions, and beliefs that influence the needs of each person. The National Rural Health Mission (NRHM) is attempting to make up for the shortage of medical professionals in India by mainstreaming AYUSH.⁷

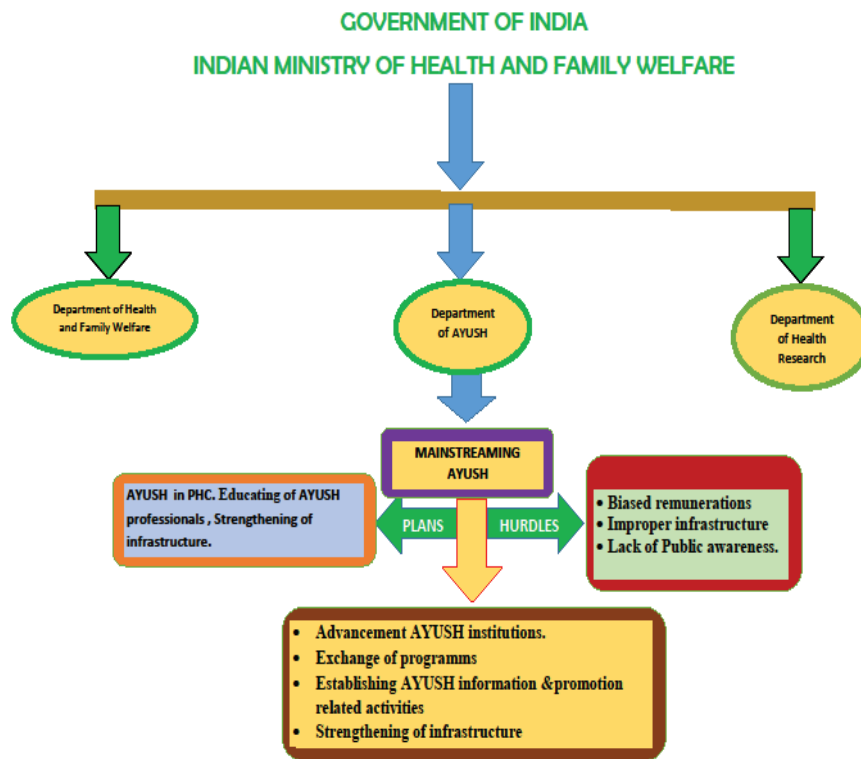


Figure 1. the strategies and barriers of integrating AYUSH in the public health system

In Figure 1. the strategies and barriers of integrating AYUSH in the public health system are revealed. By incorporating AYUSH, more opportunities for health care will rise and more people will want to study alternative forms of Indian medicine. Ayurveda is advantageous in resource-poor areas in India because it is curated to the climate and seasons in this region. In India, poverty accumulates in rural villages and urban slums, both of which are heavily populated and low in resources. Ayurveda can be beneficial in both rural and urban areas due to the use of plants from the ecosystem and everyday spices in an Indian diet that aid in healthy living.⁸

Traditional medicine is presently utilized in developing countries in Asia, Africa, and Latin America, and have begun to pop up in North America and Europe.⁴ There is an emerging demand for body-based methods and alternative Indian medicine has already spread to Ayurveda centres and spas in the western hemisphere.⁹ The ability to choose between therapies is gaining

popularity worldwide.⁹ Ayurveda is becoming popular across the world because of its natural remedies and hands-on techniques, which appeal to people who want an alternative to the chemical route.

Currently, the public health scene in India is researching a methodology for combining Ayurvedic practices with modern biomedicine, or Ayurvedic Biology.⁸ If more research is conducted, this new health care service could be used worldwide and new treatments and drug developments can be created.⁸ In 2013, it was found that out of 700,000 AYUSH doctors in India, seventy per cent practised Ayurvedic Biology for distributing pharmaceuticals, diagnostics and Ayurvedic treatments.¹⁰ Twenty per cent of AYUSH doctors work in district hospitals and primary health centres where they sub in for biomedical doctors.¹⁰ If there is a rise in AYUSH workers, more Ayurvedic treatments could be performed and relieve doctors looking after hundreds of people. A problem India faces in public health is the shortage of doctors and a shortage of fully trained

licensed doctors. It shows that only 100,000 of the one million biomedical doctors work in public health.

The World Health Organization found that only twenty per cent of doctors practising in rural areas are licensed and these types of ‘doctors’ take on seventy per cent of primary health centre visits.³

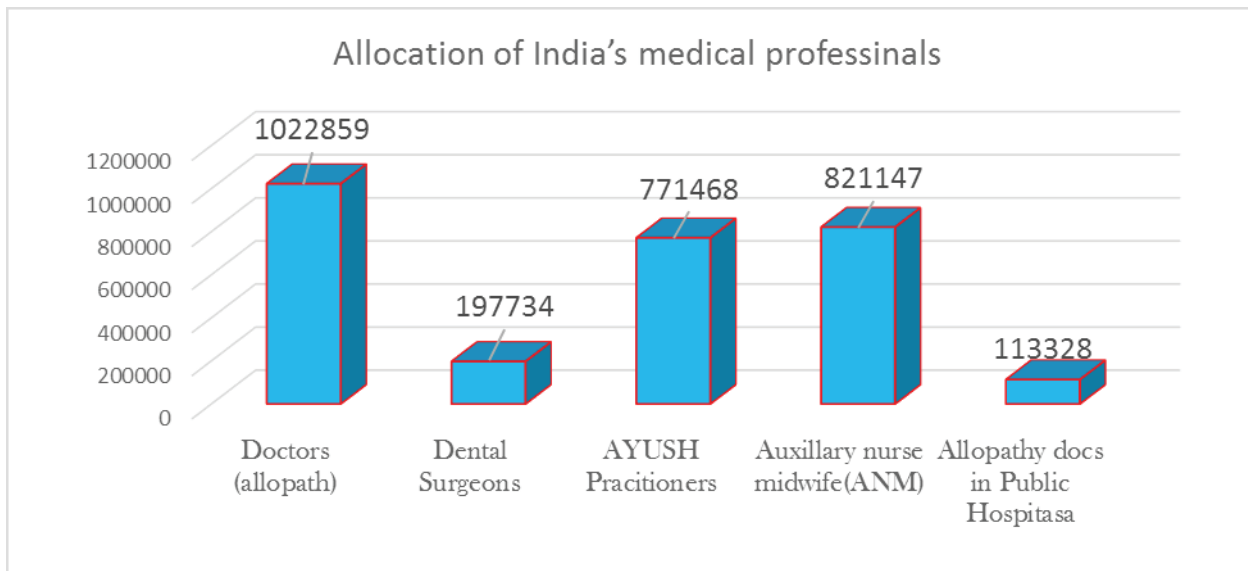


Figure 2 shows that only 100,000 of the one million biomedical doctors work in public health.

If AYUSH workers all had proper training this could make a difference in gaining better health care in India. conveys the absence of AYUSH doctors in hospitals. Since there are so few AYUSH workers in hospitals, a plan to create a department for AYUSH in hospitals would bring job openings for more workers.

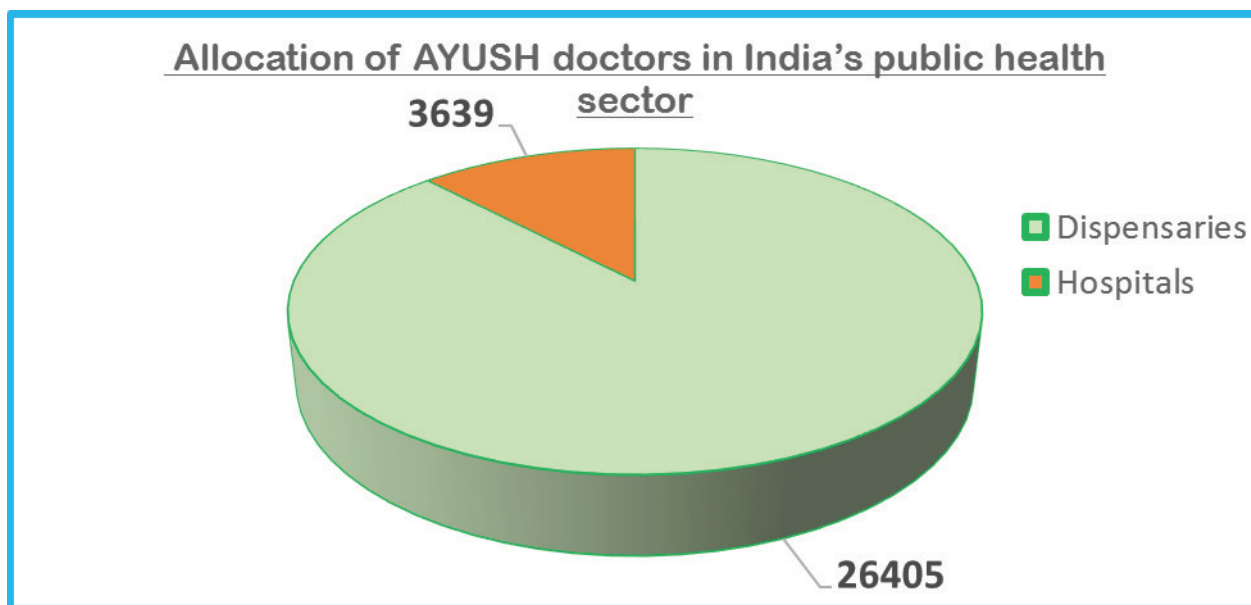


Figure 3. Allocation of AYUSH doctors in India's public health sector

A weakness of popularizing Ayurveda is the move toward commercialization. An important value within Ayurveda is using natural plants, herbs, minerals, and oils from the local ecosystem and market. This process is necessary for the freshness of all ingredients and to be as chemical-free as possible since AYUSH doctors

are to make the medicine directly before treatment. Since Ayurveda is affordable and can accommodate any patient, commercialization is unnecessary.² However, to promote AYUSH internationally, manufacturing of Ayurvedic pharmaceuticals and medicines is becoming common to supply industries, not on the local level.¹⁰ To

be affordable, Ayurveda uses plants from right outside, and by manufacturing products, costs go up and the effectiveness of the treatment goes down.

Ayurveda has a concept of microbial water purification that is the world's least expensive method.⁸ The method includes storing drinking water in copper vessels, which eradicates pathogens and viruses.⁹ This concept put to a global scale could greatly decrease water contamination in water-stricken areas around the globe. Especially in developing countries that struggle to find a plentiful source of water, let alone a clean drinking supply. Marketing this technique of purification or spreading awareness could aid many in need.

Conclusion

Ayurveda has the potential to reach many people from all walks of life. Ayurveda's versatility may be used to address global health issues. In lower-income households in rural India, Ayurvedic treatments are often self-administered for minor ailments. If these treatments are globalized, more people would be able to go to a professional for treatment, or on the other hand, the lower risk treatments could be taught in sessions to lower-income areas around the world. If the quacks working as AYUSH health care workers could be properly trained, this could give AYUSH a better reputation. People deserve to have proper health care and with quacks and a shortage of doctors, India's public health sector is falling short. The easily taught concepts in Ayurveda could be taught in schools as life skills. If Ayurveda was more globally known, India could attract more tourism with their authentic Ayurvedic dispensaries. More opportunities for professional education in Ayurveda should be available. Ayurveda may not have the biggest role in public health currently, but the opportunities for expansion are limitless.

Conflict of Interest: Nil

Funding: Nil

Ethical Clearance - Not required

Acknowledgement: Nil

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A Review on Medication Adherence in Asthma

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Abstract

Asthma is a constant fiery aviation route ailment with a high commonness, around 10% in youngsters and 5% in grown-ups in Western nations ^{1,2}. Asthma is a noteworthy reason for inability and wellbeing asset use, and diminishes personal satisfaction ³. To limit asthma intensifications, treatment ought to be balanced stepwise, determined by the patient's asthma control level⁴. Breathed in corticosteroids (ICS) are the foundation of support treatment for asthma.¹⁵ Numerous examinations have demonstrated ICS to improve manifestations and lessen asthma-related bleakness and mortality,¹⁶⁻¹⁸ however regardless of this, a high number of patients being treated by rules stay hard to control with successive intensifications and continuing symptoms.¹⁹

Keywords: Asthma, Medication Adherence, Corticosteroids, Side Effects

Introduction

Asthma treatment incorporates day by day utilization of a controller medication and utilization of short-acting bronchodilators when required for fast side effect alleviation⁵. Adherence to treatment is basic to improve the advantages of treatment. Poor adherence has been related with results like mortality⁶, asthma side effects⁷, direct and roundabout expenses of consideration and nature of life⁸. In asthma, adherence to treatment will in general be poor, with rates of <50% in kids ⁹and 30–70% in grown-ups ^{10,11} relying upon nation, age, sex and ethnicity ¹². These low adherence rates have been credited to security worries about breathed in corticosteroids (ICS) (“steroid fear”) by both the patients and the parental figures ¹³. For sure, utilization of ICS has been related with development impedance in kids and other foundational antagonistic

impacts, for example, an expanded danger of pneumonia ¹⁴. In expansion, most ICS should be regulated twice day by day, which builds the danger of poor adherence contrasted and once-day by day organization. It has been proposed that poor adherence to ICS expands the danger of intensifications. With this orderly audit, we expect to give a basic evaluation of the writing, looking at the relationship between adherence to asthma controller treatment and the danger of serious asthma intensifications in kids and grown-ups.

Breathed in corticosteroids (ICS) are the foundation of support treatment for asthma.¹⁵ Numerous examinations have demonstrated ICS to improve manifestations and lessen asthma-related bleakness and mortality,¹⁶⁻¹⁸ however regardless of this, a high number of patients being treated by rules stay hard to control with successive intensifications and continuing symptoms.¹⁹ One of the conceivable explanations behind inadequately controlled asthma might be that patients with asthma will in general display poor adherence.²⁰ Poor adherence to controller prescription may prompt a decrease in lung function,²¹ poor side effect control,²² and expanded danger of asthma-related hospitalizations.²³

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Techniques

The audit was led for a half year and an aggregate

of 100 articles were chosen. Out of that 20 articles were prohibited after analysis as it doesn't meet enough figures. Aggregate of 80 articles were taken for information extraction. The articles were gathered from information bases like pubmed, medline, elsevier.

Medicine Adherence Review

Williams et al²⁴ conducted an investigation dependent on 1,064 subjects with a specialist's conclusion of asthma and at any rate one electronic remedy for ICS over a 18-month period. Adherence was determined as the complete number of long stretches of provided drug partitioned by the quantity of long stretches of perception by connecting the electronic solutions with the medicine fill data. The quantity of days a canister would last was determined by partitioning the quantity of puffs by the recommended number of puffs/d. To represent prior drug excess, the past 3 months' ICS solution fills were inspected, and the record date was moved back as needs be the point at which a conceivable surplus was found. All things considered, adherence in the whole populace was 46%. In light of the degree of adherence, the rest of the subjects were delegated either poor-to-direct follower (adherence of < 80%) or disciple (adherence of > 80%). In any case, these subjects likewise had lower comorbidity scores and less utilization of short-acting β_2 agonists and oral corticosteroids in the earlier year, recommending that these subjects may have milder asthma contrasted and the more follower subjects. Shockingly, be that as it may, they found no contrast between these gatherings as to number of visits to out-persistent centers or, all the more strangely, number of crisis room visits or hospitalizations.

In 2 extra examinations, Williams et al²⁵⁻²⁶ also detailed a normal adherence to ICS at or underneath half. In the first of these investigations, they determined CMA preceding and following the file medicinal services contact to evaluate changes in adherence when a worsening. In the second of these examinations, they determined CMA for 176 asthma subjects joined up with huge wellbeing support associations for in any event 2 y after the record year. The CMA was observed to be $50 \pm 37\%$ (mean \pm SD). Besides, the creators likewise evaluated the ceaseless numerous interim proportion of drug holes (CMG) as the absolute number of long stretches of treatment holes partitioned by the all-out

number of days between refills during the perception time frame to $54 \pm 27\%$. CMA and CMG were determined dependent on the first and last ICS medicine fills during the examination time frame, with a necessity of a 2-fill least in that period.

Murphy et al²⁷ studied the degree of adherence to ICS in 115 subjects normally going to a particular troublesome asthma facility. Adherence was determined as CMA dependent on medicine information from their general experts and the clinic's apportioning framework. Imperfect adherence (< 80% of the medicine taken) was found in 65.2% of the all-out populace. Of the subjects recommended fixed-mix treatment with ICS and long-acting β_2 agonists, 62.4% had poor adherence, while 85.7% of the subjects endorsed ICS and long-acting β_2 -agonists in independent inhalers had adherence of < 80%. In the last gathering, adherence to long-acting β_2 agonists was vastly improved (half) than to ICS (14.3%). In this manner, these discoveries emphatically propose that patients with asthma requiring treatment with a mix of ICS and long-acting β_2 agonists ought to be endorsed fixed-mix treatment.

Bet et al²⁸ explored adherence to ICS in 182 subjects likewise alluded to a particular facility for troublesome asthma. Thirty-five percent of the subjects filled \leq half of their ICS medicines. Ladies were essentially bound to be non-follower than men. At the point when subjects were gone up against with the proof for non-adherence, 88% conceded not utilizing their ICS as endorsed, while the staying 12% kept on asserting great adherence in spite of the medicine records.

Drinking spree et al²⁹ concentrated filled ICS medicines for 1 y in 5,504 subjects with asthma and revealed a normal adherence to fixed-blend treatment with salmeterol/fluticasone of 22.2%. Besides, the greater part of the subjects (58.9%) filled their medicines just once in the year examine period. Men were somewhat more follower than ladies (23% versus 21%), though more youthful subjects had less fortunate adherence than more established subjects (< 20% adherence in the 12–35-y-old gathering and > 20% adherence in the > 35-y-old group). The most noteworthy adherence was seen in subjects > 70 y of age, despite the fact that it was just 26%. Different variables related with poor adherence were low-portion ICS and lower drug costs.

The previous finding is most likely on the grounds that subjects endorsed higher portions of ICS experienced more manifestations and along these lines were bound to fill their remedies. Moreover, Drinking spree et al³⁰ likewise examined steadiness with ICS, characterized as the level of subjects who kept filling their medicines consistently. They found that solitary 8.8% of the subjects continued with their controller treatment, and low tirelessness was related with sexual orientation (ladies had a 9.2% higher danger of cessation contrasted and men, $P = .002$) and age (subjects < 55 y of age were bound to suspend treatment than those > 70 y of age, $P < .001$).

Hwang et al³¹ considered 108 subjects > 60 y of age with a finding of asthma. The selected subjects were assembled by their asthma control, as characterized by the Asthma Control Test, into gathering I with a score of < 19 (poor control) and gathering II with a score of > 19 (great control). Adherence of > 75% was seen in 29% of subjects in gathering I and 20% in gathering II. Normal adherence for every single included subject was 23%.

Breathed In Corticosteroids And Adherence

In the examination referenced above by Murphy et al²⁷ subjects with adherence of > 80% had an altogether higher percent-anticipated FEV1 and lower level of sputum eosinophil's contrasted and subjects with a lower level of adherence). No distinction was found with respect to side effects (evaluated by the Asthma Control Poll [ACQ] 32), hyperventilation (surveyed by the Nijmegen questionnaire³³), or uneasiness and wretchedness (surveyed by the Medical clinic Tension and Gloom Scale³⁴). Moreover, when taking a gander at the earlier year, they found no noteworthy contrasts in the quantity of salvage courses of oral corticosteroids or emergency clinic or ICU affirmations because of extreme asthma intensification. In any case, they saw that poor adherence was an autonomous indicator of a past scene of mechanical ventilation because of serious asthma.

Williams et al²⁵ found changes in ICS adherence and how adherence identifies with asthma intensifications, characterized as asthma-related hospitalizations, salvage course of oral corticosteroids. The enlisted subjects were a piece of the SAPPHERE examination, as depicted by Jin et al.²⁹ All subjects had a conclusion

of asthma, therapeutic and drug store inclusion, and at least one ICS remedy filled during the investigation time frame. An aggregate of 298 subjects were joined up with the investigation, and mean adherence at pattern was 26%. In spite of the fact this could be translated as positive relationship between great adherence and intensifications, further examinations, subsequent to modifying for asthma seriousness and earlier intensifications. Actually, every 25% expansion in adherence gave 11% less danger of having one of the negative asthma-related results. Be that as it may, in the wake of isolating the subjects into gatherings dependent on asthma control at standard and level of adherence. They observed the impacts to be measurably critical just in the gathering with poor beginning asthma control and in subjects with > 75% adherence to ICS. By and large, the creators found that 24% of all asthma intensifications in the investigation could have been stayed away from with ideal ICS adherence.

Medication And Asthma

An examination from Denmark, Rasmussen et al³¹ explored the impact of a web put together administration device with respect to asthma results. An aggregate of 300 subjects with asthma, as characterized by the American College of Allergy, Asthma and Immunology asthma questionnaire,³² were selected. The subjects were randomized to standard asthma care by their general professional, treatment by authorities in aspiratory prescription in an out-tolerant center, or expert treatment through a web based administration device. At the season of enlistment and toward the finish of the half year time for testing, all subjects had planned arrangements at the out-tolerant center for clinical meeting, surveys, bronchial test testing (methacholine), and spirometry. Subjects randomized to the general professional gathering were approached to give their general specialist the test outcomes got before randomization, and for the rest of the piece of the examination time frame, these subjects were overseen exclusively by their general expert, and no extra data or treatment counsel was given by auxiliary consideration. In the master gathering, subjects were treated by the seriousness of their asthma. All gatherings demonstrated an expansion in ICS use at development, however fundamentally more subjects in the pro and web gatherings utilized ICS at development. The web, authority, and general specialist gatherings gave self-

detailed great adherence (taking the ICS consistently/ quite often) rates of 87, 79, and 54%, individually.

Conclusion

In this review most of the papers showed that more elevated amounts of adherence were related with decreased danger of extreme asthma intensifications. Further, there is a requirement for new, all around planned genuine forthcoming investigations, utilizing steady institutionalized measures for both treatment adherence and asthma intensifications.

Acknowledgement

I thank my guide Dr. D. Umamaheswari for her assistance and comments that greatly improved the manuscript.

Funding: This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest: Nil.

Ethical Clearance No: JKKNCP/EC/0516019

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Nutritional Assessment of Japanese Encephalitis and Acute Encephalitis Syndrome confirmed patients of Gorakhpur Uttar Pradesh

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Abstract

Malnutrition and infectious diseases are closely interlinked, Japanese Encephalitis and Acute Encephalitis Syndrome has also been associated with malnourishment and or poor immune system of children. The present study investigates the nutritional and growth status of children of Gorakhpur, Uttar Pradesh, infected with JE/AES. For this study 100 patients were selected (58 boys and 42 girls) purposively. The subjects were divided into 3 age groups viz, 1-3, 4-7 and 8-10. Their anthropometric characters viz, height and weight were measured. The results were compared with WHO standard. From the study, it is clear that a large number of JE/AES patients from Gorakhpur UP suffer are severely malnourished. The nutritional status of both boys and girls is lower than the WHO standard both in terms of overall bodily development and BMI.

Key Words: *Malnutrition, JE/AES, Gorakhpur, Anthropometry, WHO*

Introduction

The relationship between malnutrition and infection is the leading cause of morbidity and mortality in many poor regions of the developing countries¹. Every year about 10 million children are killed by infectious diseases worldwide before they reach age 5 and 50% of these deaths occur due to malnutrition^{2,3}. Immune system of an individual is intimately linked to the quantity and quality of food taken, and it is immune system that fights against pathogenic organisms such as bacteria, fungi, viruses, toxins, and allergic compounds⁴ and these pathogenic organisms are associated with high death rate⁵ but on the other hand malnutrition impairs immune system and thus leads to many infectious diseases. Malnutrition has been defined as a “pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients”⁶ or it may be a consequence of energy deficit or micronutrient deficiency⁷.

There are many factors associated with malnutrition or under-nutrition but poverty has been recognized as one which is both cause and consequence of malnutrition⁸. The impact of poverty upon health is largely mediated by nutrition and is expressed throughout the whole life course⁹. Generally poverty and malnutrition effects children of a country and impairs their growth and development and this effect has been well documented and reviewed in both developed and developing countries^{10,11}. Whilst more than 30 countries are home to 90% malnourished children, India stands distinct in having the largest number of malnourished children in the world^{12,13} ranks 100 out of 119 countries¹⁴. On the other hand India has been counted in the list of counties having the weakest commitment to ending child malnutrition¹⁵. Having the number double than Sub Saharan Africa, malnourishment in India has negative impact on productivity and economic growth, along with mortality rate being very high¹⁶.

As has been said earlier in this section, malnutrition and infectious diseases are closely interlinked, Japanese Encephalitis and Acute Encephalitis Syndrome has also been associated with malnourishment and or poor immune system of children. Research shows that

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children with JE/AES admitted in various hospitals of India were either malnourished or from poor socio-economic backgrounds, despite this very few researchers have focused on nutritional aspect of this deadly virus. The main objective of the present study was therefore to assess the nutritional status of confirmed JE/AES cases of Gorakhpur region of Uttar Pradesh, India.

Materials and Method

Anthropometric measurements (height and Weight) were taken of 100 JE/AES confirmed children of Gorakhpur region of Uttar Pradesh. A list of patients was obtained from District Hospital Gorakhpur. Phone number of the parents of Patients written against the respective names of patients was extracted from the list and phone calls were made to know the exact dwelling address, since the dwelling units were scattered across the region. Anthropometric measurements were taken by directly visiting the patient's home as they were discharged from hospitals. The heights of above 2 children were measured using a metal anthropometer of two meters length. In case of those children who were below two years of age, were measured using an auto-recoiling tape made up of hard steel which was identical to anthropometer in calibration. To measure weight of the children, a portable weighing scale (capacity 100 kg) was used. Children were asked to wear minimum clothes during weight and were asked to take off shoes during measuring height.

Table 1: Distribution of study subjects according to age and gender

Age Group	Boys	Girls	Total
1-3	21	14	35
4-7	31	17	48
8-10	6	11	17
Total	58	42	100

Data Analysis

Data of the children were grouped according to their gender and age. BMI of every child was calculated from his/her height and weight. BMI was calculated using online calculator of *Centre for Disease Control and Prevention*. The calculator also gives exact percentile along with BMI. Further to calculate Frequencies, Percentages, Mean and Standard Deviation, and Z-Scores, data was analyzed by using SPSS 16.0 and Microsoft Excel 7.

Results

The study included 100 JE/AES patients (58 Boys and 42 Girls) aged 1-10 years (Table 1). Table 2 shows age and sex wise mean and SD of height, weight and BMI of JE/AES confirmed children.

Table 2: Mean±SD of Anthropometric measurements of JE/AES Patients

Age Group	Boys				Girls			
	Mean Height (cm)	Mean Weight (kg)	BMI (kg/m ²)	Mean Z-Score	Mean Height (cm)	Mean Weight (kg)	BMI (kg/m ²)	Mean Z-Score
1-3	87.02±5.96	10.93±2.14	14.39±2.29	0.08	83.78±6.33	9.45±1.13	13.54±1.49	-0.06
4-7	103.59±7.39	14.54±2.23	13.55±1.65	0.16	107.31±6.87	15.88±2.94	13.68±1.42	-0.27
8-10	128.93±4.55	22.65±3.32	13.59±1.55	-0.44	126.95±2.26	21.6±2.26	13.38±0.77	0.17

The mean and SD of anthropometric measurements (height and weight) of each age group is shown in table 2. The mean height of boys ranged from 128 ± 4.55 to 87.02 ± 5.96 and among girls the mean height range was found to be 126.95 ± 2.26 to $83.78.8 \pm 6.33$. In the age groups of 1-3 and 8-10 boys weighed (10.93 ± 2.14 and 22.65 ± 3.32) more than girls except in the age group of 4-7 where girls both mean height and weight (107.31 ± 6.87 and 15.88 ± 2.94) were slightly more and better than boys. The mean BMI ranged from 14.39 ± 2.29 to 13.59 ± 1.55 in case of boys and girls had a mean BMI of 13.54 ± 1.49 to 13.38 ± 0.77 . The mean BMI Z-Score for boys ranged from 0.08 to -0.44 and girl patients had mean BMI Z-Scores ranging from -0.06 to 0.17.

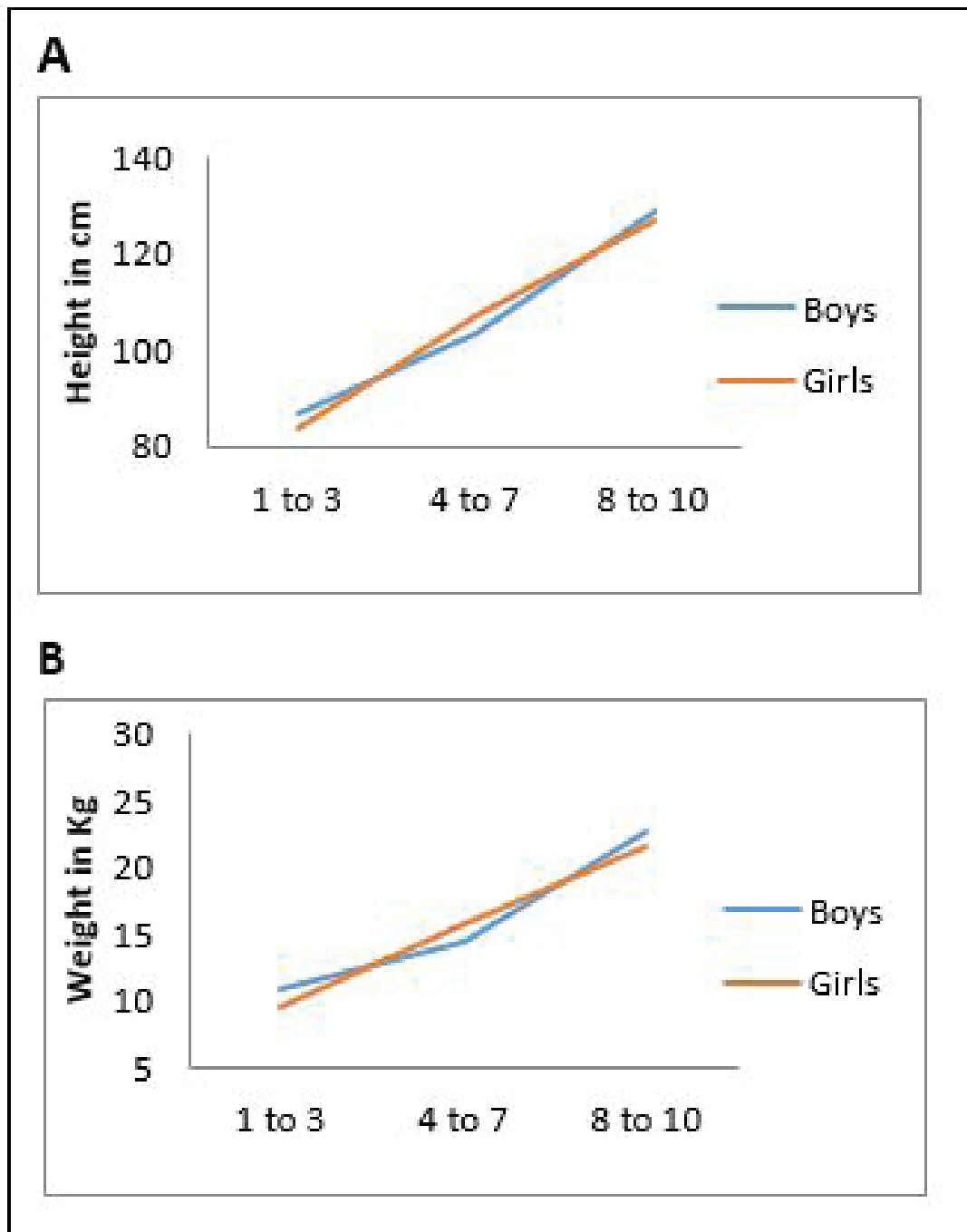


Fig 1. Showing Comparison of mean height and weight of Boys and Girls

The mean height of the patients was compared with WHO (World Health Organization) reference range, a significant difference was found in both sexes and in all age groups. Fig. 2 (C, D, E and F) shows variation between mean height and weight of boys and girls with WHO standard. It was observed that in all age groups both genders showed lesser average weight and height than the respective standard of WHO and the difference was significant. The difference is assumed to be a result of their poor economic background and food habits.

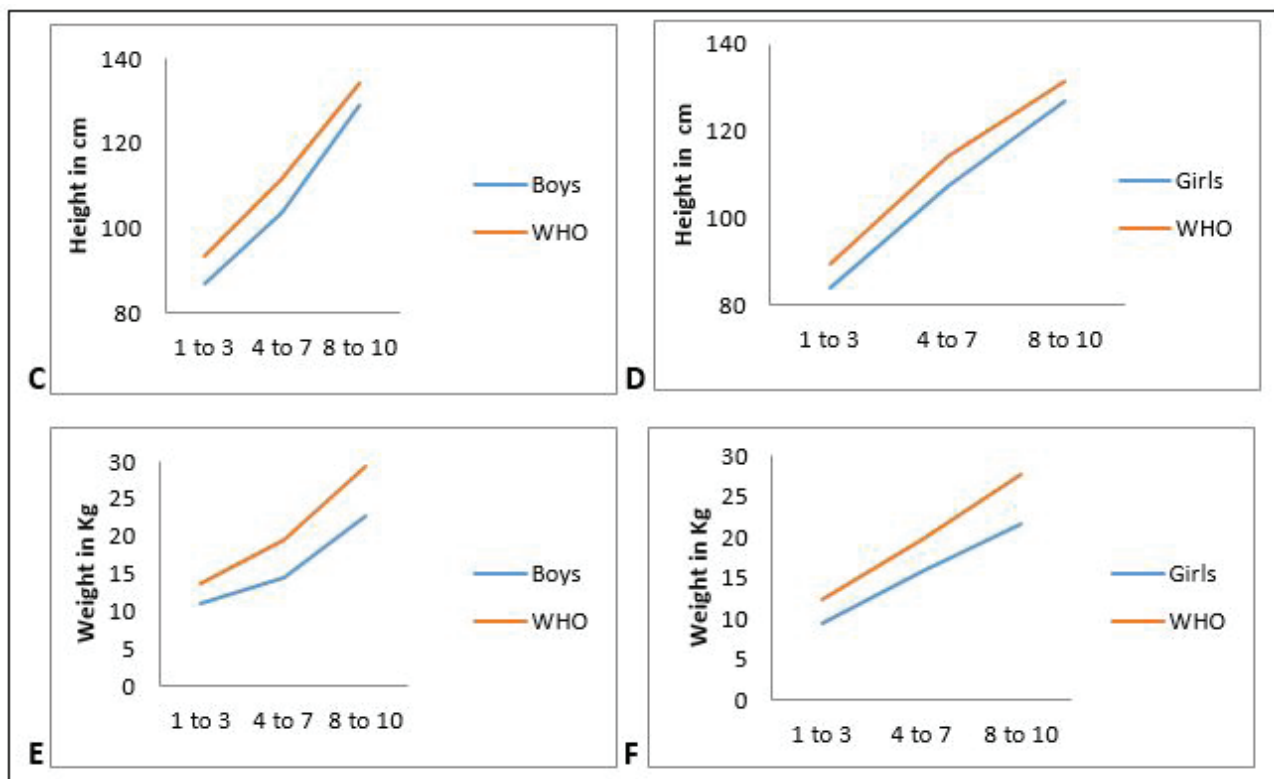


Fig. 2. Showing comparison of mean Height and weight of Boys with WHO reference.

Table 3. Shows prevalence of malnutrition based on SD

Gender	Severe Malnutrition <-2SD BMI	Moderate Malnutrition <-1SD BMI	Overweight/Obesity >+1SD/>+2SD	Normal	Total
Boys	31 (53.44)	15 (25.86)	7 (12.06)	5 (8.62)	58
Girls	27 (64.28)	10 (23.80)	2 (4.76)	3(7.14)	42
Total	58 (58)	25 (25)	9 (9)	8(8)	100

The above data of boys and girls when compared with WHO cut-off for BMI, it was found that 53.44 % boys were severely malnourished (in terms of both height and weight), 25.86% were moderately malnourished and small percentage (12.06%) were overweight or obese. A similar trend of malnourishment was recorded in case of girl subjects. 27 out of 42 girls (64.28%) were

found severely malnourished, 23.80% moderately malnourished and 7.14% were either overweight or obese when compared with WHO standard. Out of total 100 patients, only 5 boys and 3 girls were found having normal anthropometric measurements.

Discussion

Overall nutritional status of the host affect immune function and a result has profound effect on the virus itself¹⁷. Malnourished children suffer more from viral infections, viral diarrhoea, measles and malaria, with a prolonged course and intensified disease. Similarly, poor nutrition represents a significant risk factor for JE / AES, records National Programme for Prevention and Control of Japanese Encephalitis/ Acute Encephalitis Syndrome, Government of India^{18,19}. *India Today* on June 2019 reported that about 48% of children under the age of 5 in Muzaffarpur, Bihar are stunted (short for their height), 17.5% are wasted (too thin for their height), and 42% are underweight-a conspicuous sign of chronic under-nutrition, which is worse than most African countries. This trend of under and malnourishment seems to be directly linked with encephalitis and child deaths. Another record showed the association of under-nutrition and poor outcomes in the patients with viral encephalitis²⁰. As a neurotropic virus, JEV attacks the central nervous system and the clinical picture vary with the degree of central nervous system's involvement, age and nutritional status of the person affected²¹. Mosquitoes that proliferate in close association with pigs & other animal reservoirs are found to spread virus of Japanese encephalitis in malnourished children of poor families²². So, while the cause of AES is still being studied, hypoglycaemic AES can be caused by malnutrition. Malnutrition is high in Bihar and UP and children who are malnourished are prone to infection.

Conclusion

From the study, it is clear that a large number of JE/AES patients from Gorakhpur UP suffer are severely malnourished. The nutritional status of both boys and girls is lower than the WHO standard both in terms of overall bodily development and BMI. This is assumed to be a direct outcome of their low socio-economic status and poor food that they eat. Therefore need of the hour seems to implement intervention programme more effectively to improve overall nutritional status of children to keep them away from getting infected or falling prey to JE/AES or any such deadly virus.

Conflict of Interest: Nil

Ethical Approval: Before conducting research on

the selected subjects, approval was sought from District Hospitals and University Research Cell and later the consent of both parents and adult subjects was taken.

Funding Agency: Self

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Clinical Pharmacist Role in Estimation And Evaluation of Treatment Outcomes in Patients Suffering with Respiratory Tract Infections in A Tertiary Care Teaching Hospital

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Abstrac

The primary function of the respiratory system is to oxygenate blood and eliminate carbon dioxide, which requires that blood come into virtual contact with fresh air to facilitate diffusion of respiratory gases between blood and gas. It refers to any number of infectious diseases involving the respiratory tract. **Materials and Methods: Place of Study:** The study is carried out in patient “Department of Pulmonology” IP at Narayana Hospitals, Nellore, collaborated with a 1440 bedded multidisciplinary hospital.

Results: Demographic details of the patient was collected and presented as results in the data.

Discussion: In our study total of 405 patients 360 are willing to provide the information of age group 20-60 and which the maximum people suffered with respiratory tract infections were above 60 is 174(48.3%) and minimum were 20-30 Of 12(3%).

Conclusion: Our study concluded that most of the suffered with respiratory tract infections was mainly due to the different types of lifestyle. It is treated with different types of drugs and the patients feel better after treatment. As a clinical pharmacist we should educate the patients regarding the health issues and their problem. It is most effective to educate the unemployed patient regarding the disease.

Key words: *pulmonology, clinical pharmacist, Estimation, Evaluation*

Introduction

Respiratory system: The primary function of the respiratory system is to oxygenate blood and eliminate carbon dioxide, which requires that blood come into virtual contact with fresh air to facilitate diffusion of respiratory gases between blood and gas [1, 6].

Respiratory tract infection: It refers to any number of infectious diseases involving the respiratory tract [2, 8]. Infections includes group of conditions which causes inflammation from nose to alveoli [1].

Estimation:

Ø An approximate calculation of value, number, quantity of something or judgment of worth of character of someone.

Evaluation:

Ø Analysis of completed or ongoing activities that determine or support management accountability, effectiveness & efficacy using criteria governed by a set of standards.

Outcomes:

Ø These are the final results or consequences that follow from an action or situation.

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Tertiary care hospital:

Ø It is a hospital that provides tertiary care from specialists in a large hospital after referral from primary care and secondary care.

Materials and Method

Ø PLACE OF STUDY:

The study “**Clinical pharmacist role in estimation and evaluation of treatment outcomes in patient suffering with respiratory tract infections in Tertiary care Teaching Hospital**” which was carried out in patient “Department of Pulmonology” IP at Narayana Hospitals, Nellore, collaborated with a 1440 bedded multidisciplinary hospital

Study Design:

The study was prospective observational study conducted in the Department of pulmonology inpatient ward of tertiary care teaching hospitals

Ø Study Population:

This study was conducted in 400 patients who are suffering with Respiratory Tract Infections.

Ø Study Duration:

This study was conducted for a period of 6 months.

Ø Study Criteria:

Patients are considered for the study based on inclusion and exclusion criteria.

Ø Inclusion Criteria:

•All the patients suffering with different types of Respiratory Tract Infections.

- Patient age group in between 20 to above 60yrs.
- Patients with co-morbid conditions.

- Who are willing to provide the information.
- Complaints of any respiratory tract infections.
- Patient with alcohol and smoking habits.
- People suffering with seasonal Respiratory Tract Infections.
- Patient dependent upon medication.

Ø Exclusion Criteria:

- Pregnancy women.
- Lactating women
- Lack of interest to provide information.
- Pediatrics.
- Whose verbal communication was poor.
- Unconscious patients.
- Mentally retarded patients.

Ø Study Material:

- Patient informed consent form.
- A specially designed respiratory tract infection questionnaire.

Ø Study Method:

The study will be initiated after obtaining the permission from Head of the institution and Head of Department of Pulmonology. The patients considered in the study after taking informed consent from the patients or patient attendants. The patients are considered for the study based on the inclusion and exclusion criteria.

Results

Demographic details of the patient was collected and presented as results in the data:

Table-1 Shows the assessment of life in four weeks

Assessment of life	Very poor	Neither poor nor good	Good	Very good
Quality of life	24	256	62	18
Satisfaction of health	12	282	56	10
Feel of daily life	18	237	99	6
Healthy environment	34	177	136	13
Access of health services	19	113	196	32

Table-2 Shows the condition and follow up of the patient

Condition and follow ups	Never	Seldom	Very often	Always
Negative feeling	297	55	6	0
Visit of doctor	0	8	290	62
Proper medication	14	27	301	18
Medication adherence	0	36	171	153

Table-3 Shows reasons for admission in the department

Conditions	No.of patients	Frequency
Shortness of breath	324	90%
Cough	198	55%
Cough with expectorant	216	60%
Chest pain	252	70%
Fever	171	47.5%
Fluid accumulation in chest cavity	153	42.5%
Weakness/fatigue	258	71.6%
Loss of weight	174	48.3%
Loss of Appetite	226	62.7%
Decrease sleep	162	45%
Exacerbation	135	37.5%
Difficulty in swallowing	117	32.5%
Pedal edema	99	27.5%

Table-4 Shows different types of upper respiratory tract infections and lower respiratory tract infections

Types of respiratory tract infections	No.of patients	Frequency
Upper respiratory tract infections		
Allergic rhinitis	5	1.38%
Sinusitis	2	0.5%
Pharyngitis	6	1.66%
Laryngitis	8	2.22%
Lower respiratory tract infections	131	36.3%
Bronchial asthma	157	43.6%
Chronic obstructive pulmonary disease	27	6.66%
Pulmonary tuberculosis	18	5%
Pleural effusion	6	1.66%
Hydro Pneumothorax		

Discussion

In our study total of 405 patients 360 are willing to provide the information of age group 20-60 and which the maximum people suffered with respiratory tract infections were above 60 is 174(48.3%) and minimum were 20-30 Of 12(3%). The sex differentiation in which males were more prone to respiratory tract infections of 282(78.3%) and females of 78(21.66%) with educational status of uneducated members are maximum were 282(78.3%) and the minimum were graduated of 6(1.6%) and occupation was labor is more in our study i.e, 282(78.3%) and last was employed 18(5%). Nutritional status of the patients is average 234 (65%) and the minimum were good 54(15%) and food intake is also analyzed in the patients with standards and it was found that maximum were average of 270(75%) and minimum was poor 42(11.6%).

The reason for admission in the hospital is due to the shortness of breath is more after observed in maximum number of patients weakness or fatigue cough with sputum, chest pain and last was pedal edema. Based on the questionnaire the assessment of life for 4 weeks was calculated and analyzed in the patients based on this the maximum patients was satisfactory with the life, and their felt a sad feeling daily life and having a satisfactory quality of life and good healthy environment was found from the assessment of questionnaire.

The different classes of drugs used in the treatment of respiratory tract infections are mainly antibiotics 360 (100%), bronchodilators 293(81.3%) and vitamin supplements 280(77.7%) were maximum and minimum were corticosteroids 45(12.5%), antihistamines 96(26.6%) and antipyretics.

Conclusion

Our study concluded that most of the suffered with respiratory tract infections was mainly due to the different types of lifestyle. It is treated with different types of drugs and the patients feel better after treatment. As a clinical pharmacist we should educate the patients regarding the health issues and their problem. It is most effective to educate the unemployed patient regarding the disease. The government should take measures for avoiding smoking so that the health of the patient becomes good and effective. We are providing leaflets to

the patients for this conditions and measures to be taken in future to overcome Respiratory tract infections.

Acknowledgement: All thanks and praises to God Almighty for his countless, abundant and never ending blessings in completing this work. It is a proud privileged honor for us to express our hatful thanks and gratefulness to all the persons who backed us directly or indirectly through out of this research work as magnitude. Most importantly authors are thankful to patients and health care professionals.

Conflict of Interest: Yes

Funding: Self

Ethical Committee Approval: We have Memorandum of Understanding with Narayana Medical College and Hospitals to conduct the Study.

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Effect of PNF in Improving Lower Extremity Function in Adolescent with Spastic Diplegic Cerebral Palsy-A Case Report

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Abstract

Cerebral palsy is a common non-Progressive neuromotor disorder which leads to various impairments and disabilities. There are various treatment approaches in the management of children, adolescents and adults with cerebral palsy. Proprioceptive Neuromuscular Facilitation (PNF) is used to stimulate the neuromuscular system in an effort to excite proprioceptors in order to produce a desired movement. Patient was 19 years old boy with spastic diplegia. He was under physiotherapy treatment elsewhere for the past 10 years here they were focussing more on passive movements and mat activities. Patient's main concerns on approaching us were difficulty to stand independently and walk. The important clinical findings were Grade 1+ Muscle tone according to Modified Ashworth scale in bilateral adductors of hip, hamstring muscles and Bilateral Calf muscles. Highest functional status was he can able to sit independently. Patient was initially treated with tone inhibitory techniques and movement facilitatory techniques. Once the tone is normalized PNF techniques mainly rhythmic stabilization and dynamic reversals were given for 12 weeks. Berg balance scale and Gait parameters(Stride length, Cadence and Gait velocity) were taken before beginning of study and after completion of 8 weeks. There were significant changes in Berg balance scale and Gait parameters. This case report confirms that a goal oriented problem specific treatment approach can yield better outcomes even in adolescents with cerebral palsy.

Key Words: *Cerebral Palsy, Spastic diplegia, Proprioceptive Neuromuscular Facilitation, balance impairments, Gait impairments.*

Introduction

Cerebral Palsy (CP) defines a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disturbances of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behaviour, by epilepsy and by secondary musculoskeletal problems¹.

Developed countries have a prevalence of cerebral palsy, 2 per 1000 live births. Males are found to have a higher prevalence of cerebral palsy than females, with sex ratios ranging from 1.1:1 to 1.5: 1².

Topographically CP is classified into monoplegia, diplegia, hemiplegia and quadriplegia. Based on abnormal muscle tone into spastic, hypotonic, athetoid, ataxic and mixed³.

Spasticity is defined as a velocity dependant increased resistance to passive muscle stretch, or alternatively as inappropriate involuntary muscle activity associated with upper motor neuron paralysis⁴.

Spastic diplegia is the predominant type of CP in preterm children, especially in the most immature preterm children (64% to 75% of children with cerebral

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palsy born before weeks of gestation or with birth weights below 1000gm)⁵. Many children with spastic diplegia have normal tone, or even hypotonia, during the first 4 months. The onset of spasticity in the legs is insidious and slowly progressive during the first year⁶.

Common impairments in spastic diplegia include Connective tissue and muscle contractures, Cognitive and perceptual deficits, Visual and visuomotor abnormalities, Speech and learning problems, Impaired trunk control, Pelvic asymmetry, Balance and gait asymmetry^{7,8,9}.

Various interventions are proved to be effective in spastic diplegia such as Strength training programs, Constraint Induced Movement Therapy, Sensorimotor training program, balance training, Neuro Developmental Therapy and Proprioceptive Neuromuscular Facilitation to improve gait, balance and lower extremity function¹⁰

Most of the literature was focussed on young children with CP. This case report is unique as it is showing the changes in movement control in late adolescent patient with spastic diplegic CP.

Patient information: Patient was 19 year old Spastic diplegic adolescent who was under physiotherapy treatment since past 10 years. Physiotherapy treatment which he had taken previously included Passive movements and Mat exercises. He was having good communication skills, He was not going to any school, his highest functional ability was independent sitting and supported standing and walking. His primary concern was his difficulty of independent standing and walking. He stays with his father and mother who does not have any economic issues. He was the second child and elder one was fine. He was not under any medication and there were no psychological illness found.

Clinical Findings: The important clinical findings were Grade 1+ Muscle tone according to Modified Ashworth scale in bilateral adductors of hip, hamstring muscles and Bilateral Calf muscles. Bilateral Knee and Ankle Reflexes were exaggerated. Extensor lag was noticed in bilateral knee joints. Bilateral flat foot was seen, Dorsiflexion was not seen in bilateral feet. Slight exaggerated Kyphosis was noticed in spine. There was no pelvic mobility. Upper limbs were fine and able to perform bilateral asymmetrical activities.

Diagnostic Assessment: Berg balance scale was used to assess balance and various gait parameters (Stride length(cm), Cadence(steps/min) and Gait velocity(m/min)) were used to understand gait characteristics. Initial Pediatrician diagnosis of Spastic cerebral palsy was taken into consideration but to diagnose as spastic diplegia, functional movement analysis was done and based on the activities performed diagnosis was confirmed. Pre and Post scores of BBS and Gait parameters are given in table 1 and graph 1.

Therapeutic Intervention: Initially to normalise tone facilitatory and inhibitory techniques were given. It took 3 months to normalise tone. Once the tone was normalized we concentrated on strengthening with PNF techniques. To gain distal mobility proximal stability is must. We gave Rhythmic Stabilisation exercises to gain proximal joint stability in lower limbs. We started with Dynamic reversals, Repeated contractions in various patterns for pelvis and lower limbs. Intervention was given one hour a day, five days a week for 12 weeks post normalizing tone. Outcome measures were taken on the first day of PNF treatment and after completing 12 weeks. We have not changed the treatment protocol for 12 weeks and dosage was same. There was not a single day where treatment is missed. Follow up was done after 3 months of study completion and it was found that treatment was effective and maintained. Vigorous home program was given to the patient to perform at home which includes, sit to stand activities, Task oriented lower limb movements and active lengthening exercises to maintain muscle tone.

Table 1: Showing Pre post scores of outcome measures

	Pre Scores	Post Scores
Berg Balance Scale	15	28
Stride length(cm)	65	78
Cadence(steps/min)	41	68
Gait Velocity(m/min)	33	44

Discussion

This Study was aimed to evaluate the effectiveness of PNF Techniques on balance and Gait parameters in an adolescent patient with Spastic diplegic Cerebral

palsy. The previous studies of PNF in stroke populations were proved to be highly beneficial. Sang Wang et al in their study applied PNF in chronic stroke patients they concluded that PNF decreases the abnormally increased muscle tone and reduces muscle stiffness¹¹. Our study has similarities where Abnormal tone which was normalized was not reversible with three months of PNF training. One more study by Chandan et al where PNF was compared with task oriented therapy on lower extremity function in children with CP concluded that both are beneficial in improving lower extremity function¹². Our study which mainly focuses on PNF only in adolescent population showed similar results as task oriented program was given at home. There was not a significant improvement in Berg balance score because of the amount of motor learning and control which happens in adolescents is quite slow than children. Eventhough change of scores is less it is significant considering age of the child. Gait parameters were significantly improved as child started walking with cane. Child perceived that the treatment is effective and helping him to progress day by day. Though we may have not achieved complete independent walking, the achievements what we got in the patients motivated us to follow the similar protocol in other patients too.

CARE Guidelines¹³ were followed while preparing the manuscript.

Acknowledgement: We would like to thank the parents of the patient and also the patient himself who stood with us for almost 8 months. We also would like to thank Management of Vikas College of Physiotherapy for providing necessary infrastructure.

Informed consent was obtained from patient and ethical clearance was obtained from Institutional ethical committee

Source of Funding: None

Conflict of Interest: None

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Class Imbalance Applied to Medical Neuroimaging for Classification of Alzheimer's Disease

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Abstract

Class imbalance is an issue that naturally occurs when a database is sparse or incomplete. This can occur in medical diagnostics when a large percentage of tests ran to return negative results rather than a positive. Classification models are sensitive to an imbalanced training set, and training on one can cause undesirable biases. This work presents an overview of the effects of class imbalance on classification models in Alzheimer's detection utilizing voxel based-morphometry (VBM). MRI scans are processed by FreeSurfer where cerebral volumetric and thickness are taken as feature vectors. The effects of class imbalances on multiple machine learning models were compared to one another. Furthermore, different biomarkers were studied for their effect on different metrics of trained models. The classification models were trained to detect the following categories: Alzheimer's disease (AD), mild cognitive impairment (MCI), and normal controls (NC). SVM, KNN, MLP, Random Forest, etc. algorithms were evaluated for the prediction analysis. It was observed that class imbalance did not produce any significant effects on the disease classification process.

Keywords: *Classifiers, Alzheimer's disease, Mild cognitive Impairment, Voxel-Based Morphometry*

Introduction

Alzheimer's disease (AD) is a neurodegenerative disorder that presents with symptoms including memory impairment, executive dysfunction, and other deficits in other cognitive domains. Normal neuron activity creates amyloid precursor protein, but in AD, a dysfunctional enzyme creates a shorter protein. A build-up of these form of beta-amyloid plaques, which are toxic to and inhibits neuron function by injuring synapses and neurites.¹ Beta-amyloid plaques also promote the formation of neurofibrillary tangles that stops neuron function.² Both result in neurons disconnecting from others, they stop communicating and die, resulting in memory loss.³ As this continues, those brain regions shrink and function is impaired.

Neuroimaging technology such as magnetic resonance imaging (MRI) has significantly contributed to further understanding of brain regions, and associated diseases such as AD. Despite the limits to detail in images, (units called voxels make up an image, and a single voxel can represent a million brain cells)⁴ predictions can be made from observations of activity among groups of voxels correlating to specific brain regions. MRI is also able to accurately measure the size of brain structures, in three-dimensional volume.³

Classifiers

Recently, machine learning has been applied to the medical field.⁵ A decrease in the cerebral volumetric and thickness are physiological symptoms of Alzheimer's disease.⁶ These biomarkers can be utilized as indicators for machine learning algorithms to detect AD.^{6,7} Although several classification methods have been utilized, Support Vector Machines (SVM) is the most common approach in practice, along with both the MRI images^{8,9,10} and PET images.^{11,12} For instance, Davatzikos et al.¹³ implemented SVM in MRI imaging

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and cerebrospinal fluid (CSF) biomarkers and applied it for MRI, FDG-PET, and CSF as in.¹⁴

However, only the binary classifier has been discussed in many of the earlier referred researches. As an example,¹³ regarded the only AD vs NC classifications, while Cui et al.¹⁵ considered investigating both MCI vs NC and AD vs NC. In¹⁶ the author has dealt with the transition of MCI to AD, whereas, Vounou et al.¹⁷ reported the differences in progressive p-MCI and stable s-MCI patients that were discussed as a binary issue. As noted by Amir et al. in their study on the use of convolutional neural networks (CNN) for classification of spinal MRIs, and as discussed in recent papers on utilizing SVM^(18,19,20) valuated diffusional MRI images using multilayer perceptron (MLP) and Kohonen self-organizing map (SOM) classifiers to improve the standard analysis of apparent diffusion coefficient (ADC) maps. MLPs are a staple artificial neural network (ANN) architecture that utilizes a feed-forward system with multiple layers of nodes that have a linear or nonlinear activation function. These nodes are typically trained with some variation of back propagation. Kohonen SOM is a different ANN architecture that utilizes unsupervised learning to create a map, which is a form of dimensionality reduction.

The research group utilized 3 different images with varying exponent diffusions to calculate an ADC map. What they found was a Kohonen organization map of 99.9% accuracy and MLP with an accuracy of 88.5%²⁰. Similar studies by Hamou, et al.,²¹ in 2010 utilized clustering techniques and decision trees to determine whether or not participants with AD or MCI states from MRI images. Their study revealed that that standard K-means clustering was not accurate enough and they were able to obtain a better representation by further refining the results with decision trees.²¹ Even though the binary classification is easier and far less complex, AD treatment is a multi-class problem, and multi-class methods should, therefore, be studied.

Class Imbalance

The class imbalance is often a case wherein the category allocation is complicated. This case is frequently observed within the data of Alzheimer's disease, that differentiates conventional models from various greater categories.²² In order to evaluate the pair of results from

each class, training of the binary classifiers has been suggested^(22,23,24), and therefore, both groups also add to the selection criteria. In a multi-class analysis that was outlined in²⁵, deliberately included class allocation for AD prediction. The analysis primarily depended on multi-class segregation of the problem into binary problems. The findings, thus, acquired were promising. Though, their strategy did not significantly addressed the class imbalance, that motivates the current study.

Materials and Method

Table 1: Stages of cognition and size of samples used with a train/test split of 80:20.

Stages	Number of Samples	Train/Test
Alzheimer's Disease (AD)	65	52/13
Mild Cognitive Impairment (MCI)	116	93/23
Normal Cognition (MC)	96	84/12

Datasets

Data used in the preparation of this article were obtained from the Alzheimer's disease Neuroimaging Initiative (ADNI) database (adni.loni.usc.edu).²⁶ The ADNI sample comprising pooled ADNI1, ADNIGO, and ADNI2 subjects was used to perform primary analysis comprising modeling and prediction tasks.²⁷ ADNI has 3 phases: ADNI-1, ADNI-GO, ADNI-2 that varied in their goals and cognitive stages. The stages given in the dataset are normal control (NC), significant memory concern (SMC), early mild cognitive impairment (EMCI), mild cognitive impairment (MCI), late mild cognitive impairment (LMCI), and Alzheimer's disease (AD). In this research, MCI, NC, and AD data sets from ADNI were studied with their quantities highlighted in Table 1.

Validation of Data for the Study

Many researchers have identified specific neuropathic behaviors linked to the cognitive and functional decline in Alzheimer's disease and its prodromes²⁸ in search of the detection of accurate biomarkers. The absence of manifestations of localized canonical atrophy may be related to behavioural, biological and environmental

factors.²⁹ Therefore, models with an ensemble of imaging characteristics, genotypic and diagnostic information were delivered.³⁰ The improvements in performance delivered by the image details however are ambiguous in some of these multimodal systems.

MRI Processing

After the data was received from ADNI, the data was processed further using FreeSurfer. A set of software tools released by FreeSurfer has allowed researchers to study cortical and subcortical brain anatomy in a streamlined method. Here, the three types of probabilities are computed at each point (voxel): the probability that a point belongs to each of the label class, probability of the spatial configuration, and the probability of the intensity/curvature.

Feature Vectors

For our work, the trained prediction models use three distinct sets of features. In the first feature set, aseg.stats files were utilized containing 45-dimensional vectors. The volumes of the anatomical structures were then normalized with the subject's intracranial volume to account for variance in head-size. The left and right cerebral white matter, cerebral cortex, 3rd and 4th ventricle, lateral ventricle, inferior lateral ventricle, cerebellum white matter, cerebellum cortex, thalamus proper, caudate, putamen, pallidum, hippocampus, and the amygdala were a part of this set. For the second feature set, aparc.stats files were used containing 68-dimensional vectors. This second feature set contained the average thickness for the various structures like superior frontal, rostral middle frontal, caudal middle frontal etc. And finally, the last feature set contained a combination of the two aforementioned feature sets

In the case of MRI images, FreeSurfer was utilized to extract important features and then utilized principal component analysis (PCA) where a trained classification model can be used to query new images.

Results and Discussion

One is more inclined to believe that a stronger model is easier to create with a larger dataset. That is, however, not necessarily the case. As seen in Table 1, the largest data provided were for MCI and NC patients; it is observed that MCI vs NC was the most difficult

to model. Moreover, drastic changes in biological structures as seen in AD vs NC patients are more readily classified. Alzheimer's disease classification versus patients who show mild cognitive impairments are also moderately detectable. What this alludes to is that the progression from MCI to Alzheimer's disease is severe. EE and BC are shown to have moderate performance in all three binary classification problems in comparison to other classifiers. Although EE and BC were incorporated specifically to mitigate class imbalances, it was found that the model either performed moderately or generally under performed.

In contrast, SVM drastically decreases in overall metrics when classifying NC vs. MCI while it excels at classifying AD vs. NC and AD vs. MCI. In the case of MCI vs. NC, MLP architecture has shown to be slightly more favorable. This slight advantage could be attributed to MLPs' advantage of extracting complicated trends from data. What is surprising is that the imbalanced dataset has no drastic effects seen in AD vs. NC and AD vs. MCI, as their F-1 and MCC scores show adequate values. From the cross-validation results for AD vs. NC classification, there is a clear distinction that can be made for the binary classification and that it generalizes well. Moreover, SVM seems to continually indicate strong cross-validation results. Furthermore, there is a decrease in the ability of classification when both biomarkers are used to train the models as seen by low MCC numbers. EE and BC are shown to have moderate performance in all three binary classification problems in comparison to other classifiers.

Although, EE and BC were incorporated specifically to mitigate class imbalances, it was found that the model either performed moderately or generally underperformed. In contrast, SVM shows a drastic decrease in metrics when classifying NC vs. MCI while excels at AD vs. NC and AD vs. MCI. In the case of MCI vs. NC, MLP architecture has shown to be slightly more favorable.

Moreover, the ROC analysis coincides with the confusion matrix analysis. In general, the ROC curves for MCI vs. NC lies either below linear or oscillate around a slope of 1. This indicates that the methods either under-performed or were no better than random search.

Conclusion

SVM demonstrated a drastic decrease in metrics when classifying NC vs. MCI while excelled during the classification of AD vs. NC and AD vs. MCI. In the case of MCI vs. NC, MLP architecture was slightly more favorable. Consecutively, it was surprising that the imbalanced dataset had no significant effects in AD vs. NC and AD vs. MCI, as their F-1 and MCC scores. However, the differences in an MRI image between patients that shows MCI versus one that is not impaired is subtle. Therefore, more advanced neural network architecture may prove to be advanced classifiers. Advanced classifiers will allow us to create significant CBIR systems that are more robust, where a robust CBIR system is one of many requirements to deploy a query image for classification.

Acknowledgment: Data collection and sharing for this project was funded by the Alzheimer's Disease Neuroimaging Initiative (ADNI) (National Institutes of Health Grant U01 AG024904) and DOD ADNI (Department of Defense award number W81XWH-12-2-0012). The grantee organization is the Northern California Institute for Research and Education, and the study was coordinated by the Alzheimer's Therapeutic Research Institute at the University of Southern California. ADNI data are disseminated by the Laboratory for Neuro Imaging at the University of Southern California.

Conflict of Interest : The authors have stated that the studies, authoring and/or publishing of this paper do not raise any prospective conflicts of interest.

Funding: Self

Ethical Clearance: The authors have stated that the studies, authoring and/or publishing of this paper do not raise any prospective ethical issue.

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The Dearth of Dengue Awareness in Rural Population – *Time to Act!!!*

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Abstract

Background: Dengue, accounts to a notable economic and disease burden universally, is surging rapidly into the countryside. This research was undertaken to study awareness of dengue and factors affecting it among adults in a rural area.

Methods: Cross sectional study was conducted and data was collected by house to house survey after taking consent, using predesigned and pre-tested proforma.

Results: Majority of 53.92% belonged to 30-39 years. 52.94% were males, 54.41% were literates and 33.33% constituted to lower class. The common information source was hospital/health care personnel. 58.33% considered dengue as fatal, 55.88% opined that dengue could not be prevented. The mode of transmission was quoted as mosquito bite by 65.20%, 57.35% considered day and night as the biting habits of mosquito. Most common symptom was quoted as fever, joint, bone or muscle pains and headache. 89.71% considered insect repellents/creams as most common preventive measures. Comprehensively, 38% had sufficient awareness about dengue. Significant associations were age ($p=0.000016$) and literacy ($p<0.00001$).

Conclusion: Despite various efforts in pursue of dengue, awareness in rural region is underneath in diverse aspects. The disease prevention and treatment can be alleviated through variety of endeavours and thus abate morbidity and mortality.

Keywords: Adults, Awareness, Dengue, Literacy, Morbidity, Mortality, Rural.

Introduction

Dengue is an important public health concern globally.^{1,2} It is a mosquito-borne arboviral infection.^{3,4} The virus accountable for causing dengue, is named as dengue virus (DENV). There are four types of DENV serotypes (DENV1, DENV2, DENV3 and DENV4).¹ Dengue virus is transmitted by female mosquitoes

mainly of the species *Aedes aegypti* and, to a lesser extent, *Aedes albopictus*.^{1,5} The *Aedes aegypti* mosquito is contemplated as primary vector of DENV. It dwells in urban habitats and breeds in man-made containers. *Aedes aegypti* is a day-time feeder and peak biting periods are early in the morning and in evening hours before sunset.⁶

Dengue viruses cause symptomatic infections or asymptomatic seroconversion. Symptomatic dengue infection is systemic and dynamic disease which has wide spread clinical spectrum.⁷

Dengue is a severe, flu-like illness affects infants, young children and adults, but seldom causes death. Symptoms last for 2–7 days, after an incubation period of 4–10 days after bite from an infected mosquito. The

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World Health Organization (WHO) classifies dengue into dengue (with / without warning signs) and severe dengue.^{1,8}

The global incidence has raised to such an extent that half of world's population is at risk.⁹ In last 50 years, incidence has extended to 30-fold with enlarging geographic expansion to new countries, from urban to rural zones.^{10,11,12}

In defiance of risk of infection existing in 128 countries, 70% of actual burden is shouldered by Asia.^{1,13,14}

In India, epidemiology of dengue was first proclaimed in Chennai 1780 and first outbreak occurred in Kolkata in 1963. India has seen subsequent outbreaks of dengue.^{15,16,17} Earlier dengue was restricted to urban region but now advanced into countryside rural areas.¹⁵

During 2017, about 157,996 cases were reported with 253 deaths. The case fatality rate was 0.16 per cent. The highest numbers of cases were reported from Tamil Nadu, Kerala, Karnataka, Punjab and West Bengal. Karnataka registered 17265 cases with five deaths during 2017.³

With above overview, this study was undertaken with an objective to assess awareness about dengue.

Methodology

Study design:

A community-based cross-sectional study was done in Yadwad village, field practice of Rural Health Training Centre attached to a tertiary care hospital in Dharwad district of Karnataka, India. The study was conducted for a period of three months. All individuals 18 years and above were included.

Sampling method:

The sample size was calculated by using the formula $n = 4pq/L^2$, anticipated proportion of inadequate knowledge regarding dengue as 50%, absolute precision as 7% and 95% confidence interval. Final sample size was estimated to be 204.

The total population of Yadwad village is 3600. A total of 720 houses were estimated in study area with

an average of five members in each family. To achieve required sample size, every 3rd house was selected and only one person from each family was included in study and was considered to be representative of selected family and to avoid duplication, covering entire population.

Sampling procedure:

House to house survey was carried out by the investigators; by doing systematic random sampling (every 3rd house was considered). Anganwadi workers and medico social workers helped in developing rapport with participants. One person was selected from each house and was considered as representative of family, to avoid duplication of data and recall bias.

Inclusion and exclusion criteria:

People who were residing in study area for more than one year and who gave consent on a voluntary basis to participate were included. People who denied to consent for participating in the study, history of having contacted dengue infection among themselves or any of the family members in the recent one year and those who could not be contacted after three visits were excluded.

Data collection:

Data were collected by interviewing all 204 study participants by conducting house-to-house survey using a pre-designed and pre-tested semi structured proforma, in which, part I included socio-demographic profile like age, gender, religion and socioeconomic status. Part II comprised of questions relating to general awareness about dengue as well as questions pertaining to dengue vector, disease signs and symptoms.

The score relating to awareness of dengue was assessed on three essential questions:¹⁹

- 1) Mode of spread of dengue
- 2) Common symptoms of dengue
- 3) Preventive measures both personal and environmental.

To categorize dengue awareness as "Sufficient", participant needed to have correct responses to all three questions. All other combinations were captioned as

“Insufficient”.

The questionnaire used in study was translated to vernacular language and validated by investigators. Data was collected after signing a written informed consent form on voluntary basis and assuring the confidentiality face to face interview was conducted. Data analysis was done using SPSS software version 22.0. Descriptive statistics and Chi-square test was applied to find an association between two attributes and $P < 0.05$ was considered as statistically significant.

Results

A total of 204 people participated in the study. The socio-demographic characteristics were as follows: majority of 53.92% were in the age group of 30-39 years. 52.94% males, 59.31% were Hindus. 54.41% were literates. 33.33% and 29.41% of belonged to lower class and lower middle class respectively [(SES), Modified B. G. Prasad's Classification 2019 - India].²⁰

Table 1 shows the general awareness about dengue. Most common source of information was found to be hospital/health care personnel followed by mass media. (58.33%) considered dengue as a fatal illness.

Awareness about dengue vector and disease is described in table 2. The mode of transmission of dengue was quoted as mosquito bite by 133 (65.20%), 117 (57.35%) considered day and night as biting habits of the mosquito. The participants told most common symptom as high fever 189 (92.65%), 183 (89.71%) insect repellents/creams as common preventive measure.

Table 3 illustrates data pertaining to association of sociodemographic profile with awareness of dengue. 77 (38%) had sufficient awareness about dengue. Significant associations were age ($p=0.000016$) literacy ($p<0.00001$) and nuclear families ($p=0.002015$).

Table 1. General Awareness about Dengue among the Study Participants (n=204).

Variables	Number	Percentage (%)
Source of Information*		
Mass media (TV/Radio /Newspaper/Internet sources)	91	44.61
Friends/Family/Neighbours	43	19.20
Hospital/Health care personnel	126	61.76
Dengue is Fatal illness		
Yes	67	32.84
No	114	55.89
Don't know	23	11.27
Dengue is Preventable		
Yes	61	29.90
No	114	55.88
Don't know	29	14.22
Vaccine for Dengue		

Cont.... Table 1. General Awareness about Dengue among the Study Participants (n=204).

Yes	12	5.88
No	84	41.18
Don't know	108	52.94
Hospitalization required for Dengue		
Yes	71	34.80
No	133	65.20
Transmission to more than one person through multiple bites		
Yes	29	14.22
No	72	35.29
Don't know	103	50.49
Human to Human transmission		
Yes	51	25.00
No	101	49.51
Don't know	52	25.49

Multiple responses*Table 2. Awareness about Dengue Vector and Disease among the Study Participants (n=204).**

Variables	Number	Percentage (%)
Mode of transmission		
Contaminated Food/Water	10	4.90
Infection	33	16.17
Mosquito bite	133	65.20
Flies	28	13.73
Name of dengue transmitting mosquito**		
Correct response	57	27.94
Incorrect response	147	72.06
Breeding habits of the mosquito		
Clean water	14	6.86
Dirty water	81	39.71
Clean as well as dirty water	68	33.33

Cont... Table 2. Awareness about Dengue Vector and Disease among the Study Participants (n=204).

Water filled containers	41	20.10
Biting habits of mosquito		
Day and Night	117	57.35
Day	53	25.98
Night	34	16.67
Signs/Symptoms*		
High Fever (40°C/ 104°F)	189	92.65
Headache	114	55.89
Pain behind eyes	21	10.29
Nausea, vomiting	89	43.63
Swollen glands	09	4.41
Joint, bone or muscle pains	171	83.82
Rash	63	30.88
Warning signs*		
Persistent vomiting	98	48.04
Rapid breathing	23	11.27
Severe abdominal pain	87	42.65
Bleeding gums	11	5.39
Fatigue	175	85.78
Blood in vomit	18	8.82
Restlessness	39	19.11
Preventive measures*		
Clothing that covers whole body	116	56.86
Screens over doors and windows	87	42.65
Insect repellents/creams	183	89.71
Mosquito Nets	77	37.75
Elimination of breeding sites	43	21.08
Spraying of insecticides	27	13.24

*Multiple response, **Correct response-Aedes aegypti.

Table 3. Association of Sociodemographic profile with Awareness of Dengue among Study Participants (n=204).

Sociodemographic variables	Awareness about Dengue		Significance
	Sufficient (n=77, 38%)	Insufficient (n=127, 62%)	
	Number (%)	Number (%)	
Age (In Years)			
<25	08 (10.39)	06 (4.72)	$\chi^2=27.449$ $p=0.000016$ Significant
25-29	21 (27.27)	17 (13.39)	
30-34	28 (36.36)	23 (18.11)	
35-39	12 (15.58)	47 (37.01)	
≥ 40	08 (10.40)	34 (26.77)	
Education			
Literates	62 (80.52)	49 (38.58)	$\chi^2=33.9867$ $p<0.00001$ Significant
Illiterates	15 (19.48)	78 (61.42)	
Occupation			
Unskilled	26 (33.77)	57 (44.88)	$\chi^2=5.7389$ $p=0.056731$ Not Significant
Semiskilled	38 (49.35)	61(48.03)	
Skilled	13 (16.88)	09 (7.09)	
Type of Family			
Nuclear	12 (15.58)	08 (6.30)	$\chi^2=12.4146$ $p=0.002015$ Significant
Joint	42 (54.55)	51 (40.16)	
Three Generation	23 (29.87)	68 (53.54)	
Socioeconomic status*			
Upper class	06 (7.79)	05 (3.94)	$\chi^2=5.9469$ $p=0.203148$ Not Significant
Upper middle class	11 (14.29)	17 (13.39)	
Middle class	08 (10.39)	29 (22.83)	
Lower middle class	27 (35.06)	41 (32.28)	
Lower class	25 (32.47)	35 (27.56)	

*As per Modified B G Prasad Classification 2019²⁰.

Discussion

The present study was aimed at assessing awareness of dengue. Sufficient awareness regarding dengue was seen in 77 (38%) of rural population. Regardless of dengue being a major public health problem, there is dearth in awareness.

In our study, 53.92% were of 30-39 years whereas in a study conducted by Naik R P et al.,²¹ in Nalgonda, Andhrapradesh, 53.4% belonged to 15-30 years of age.

In a study conducted by Chinnakali P et al.,²² AIIMS, New Delhi 14.8% were illiterates in contrast to the present study where in 45.59% had no formal education.

In a study done in Puducherry, by Krishnamoorthy Y et al.,²⁴ it was found that majority of 34% belonged to class IV socio-economic status which was in similarity to present study where a maximum of 33.33% belonged to lower middle class as per Modified B G Prasad Classification 2019.²⁰

Also, in our study, 55.88% told that dengue could not be prevented; whereas in study done by Arora P et al.,²³ in Delhi it was found that 90% considered dengue as preventable.

In the present study, 65.20% of respondents told that mode of transmission of dengue was mosquito bite which was in similarity to a study done in Puducherry, by Krishnamoorthy Y et al.,²⁴ where in 52.3% respondents knew about mode of transmission.

In a study conducted by Chinnakali P et al.,²² AIIMS, New Delhi. It was found that 73% were aware of one of breeding sites of *Aedes aegypti* which was in contrast to our study where in only 20.10% knew about the correct breeding site of the mosquito.

25.98% of respondents in present study knew about day time biting habits of mosquito where as in a study done in Chennai by V Ashok Kumar et al.,²⁵ 40% knew that dengue transmitting mosquitoes bite at day-time.

In a study conducted by Naik R P et al.,²¹ in Nalgonda, 57.53% respondents could enumerate fever as the presenting symptom whereas in the present study 189 (92.65%) knew that fever was most common.

In a study done by Arora P et al.,²³ in Delhi it was found that 96.4% respondents considered dengue as serious illness which was in contrast to present study where 32.84% told dengue as fatal.

As a result of various climatic changes, rise in novel serotypes of dengue vectors and epidemiological transition there is rapid rise of dengue cases. It is need of hour to extend efforts to create awareness and thereby reduce morbidity and mortality of disease.

Conclusion

The present study revealed that 38% population in rural area had sufficient awareness of dengue. There is definitely a dearth in knowledge of dengue. On that account, wide spread information, and communication through health education and campaigns must be intensified actively involving the individuals, families and community as a whole to bring about sufficient and authentic awareness about dengue and thus prevent the consequences related with disease and hence promoting positive health and thereby preventing illness. With adequate knowledge, positive attitudes and right practices spread of dengue can be limited and rise in cases can be impeded effectively.

Acknowledgement: We express our sincere heartfelt gratitude to all study participants for contributing in research.

Ethical Clearance : As it was a community based research, willing participants were enrolled for study after obtaining written informed consent on voluntary basis.

Conflict of Interest: Nil

Sources of Support: None

Sources of Funding: None

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Current Scenario of Health Insurance in India: A Study Comprising Various Challenges and Measures For It

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Abstract

Ensuring healthy lives and promoting the wellbeing at all stages is necessary for making the process of sustainable development into reality. However, Poor accessibility to healthcare services especially in developing countries acts as a barrier towards this. Every year, Insufficient Government expenditure on healthcare services resulting heavy out of pocket healthcare expenses push people into vulnerable situation. In such a situation, the role of health insurance becomes very significant. Considering all these factors, in country like India, a well organised health insurance market has been gradually evolved over the years. But it is not sufficient because many people are still left untreated and even approximately 25% people are pushed below poverty line by catastrophic impact of out of pocket healthcare expenditure every year. Factors like lack of awareness, policy loopholes, poor infrastructure etc. are mainly responsible for the poor performance of the health insurance market in India. Through this paper, it is tried throw light on all these phenomena comprehensively along with some measures to correct the lacunas.

Keywords: *Health insurance, Challenges, Measures, India*

Introduction

Choices about financing healthcare services have become primary concern to health policy makers so as to achieve health policy goals. Dominance of out of pocket healthcare expenditure in most low income countries indicates that access to healthcare services is primarily a function of individual's ability to pay which cannot be of equal in any case. Only 30% of total health expenditure is spent by Government of India is not at all sufficient to cover almost 1.21 billion populations.¹ Healthcare expenditure in India in 2014 constitutes almost 4.7% of GDP, but contribution of Government is only 1.4% of GDP.² Majority (62.4%) of total healthcare expenditure constitutes out-of-pocket payment at the time of service utilization.³ Based on 2015 estimates, only 288 million approximately, less than one-fifth of India's population, were covered by health insurance in India.⁴ In treating the in-patients, private institutions dominated both the rural (58%) and urban areas (68%) respectively.³ High value diagnostics and drugs make healthcare cost rapidly rising and in most of the cases it forces people to opt for borrowings, sale of physical assets in order to support their expenses on healthcare. Especially

24.9% of rural and 18.2% of urban households depend primarily on borrowings for meeting their healthcare expenditures.⁵ The 52nd report of NSS shows that 24% and 21% of untreated ailments in both rural and urban areas respectively was mainly due to lack of monetary resources.⁵ Again, among those who get hospitalized, approximately 25% are pushed below poverty line by catastrophic impact of out-of-pocket healthcare expenditure.⁶ Dual disease burden of communicable and Non-communicable diseases and coupled with spiraling health costs and poor healthcare delivery due to inadequate public spending on health along with lack of insurance coverage results in excessive financial burden on the poor and erosion in their incomes. In such a situation, health insurance can really work as a protective shield against any health related emergency. Purchase of health insurance not only brings peace of mind but also one can avail tax benefits under section 80D of the Income Tax Act, 1961.⁷

In response to growing demand for health insurance, this paper tries to make an overview of Health Insurance business in India along with various challenges faced by it.

Theoretical Framework:**Health Insurance**

Health insurance is a kind of insurance coverage against uncertain health risks to an individual. It is a type of contract in between an insurer and an individual or group in which insurer agrees to provide specified health insurance cover at a particular "Premium".⁸

The rationale for Health Insurance is based on "Laws of large numbers" which explains that the average behavior of a group of individuals is more predictable than that of a single individual.⁹

Demands for Health Insurance:

The conventional models of demand for health insurance assumes that under conditions of rationality and risk averseness, decisions to purchase insurance is based on the expected utility gain.^(10,11)

Again according to contingent theory, demand for health insurance is derived from the demand for an uncertain payoff in the ill state rather than demand for certainty or risk averseness.^(12,13,14)

Feldstein (1973), states that the price of healthcare or healthcare expenditure also has a relation with demand for insurance.¹⁵

Increased income and education also have link to the demand for insurance. Higher income decreases the opportunity cost associated with the purchase of health insurance.^{16, 17}

Adverse Selection

It is a situation where people having different health risks are not charged premium equal to their expected marginal cost of their insurance. Thus, the customer base of the insurer consists mainly of high risk people.¹⁸

Moral Hazard

This is the incentive to increase risky behavior because the adverse outcomes of that behavior are covered by insurance. Informational asymmetry is mentioned as the source of moral hazard. It is a tendency of the insured people to increase their consumption of healthcare.¹⁹

Forms of Health Insurance:

Health Insurance is mainly categorized into four forms- Mandatory/social, voluntary, Employer provided and community based and further classified as public and private. Two mandatory Government run health insurance schemes are- Employee State Insurance Scheme (ESIS) and Central Government Health Scheme (CGHS). Government of India launched some voluntary social health insurance schemes like Rastriya Swasthya Bima Yojna . Again, in 2018 Central Government launched Ayushman Bharat- Pradhan Mantri Jan Arogya Yojna, largest health insurance scheme in the world.²⁰ Medilaim, voluntary health insurance policy is offered by both Public and Private sector General Insurance companies. Again, Community health insurance schemes are there to serve the needs of the poor and are mainly offered by NGO's, Trusts and hospitals etc.

Objectives

To provide an overview of health insurance in terms of its current performance, challenges faced by it and also to provide suggestions towards the development of health insurance sector in India.

XV.**Methodology:**

This study is mainly based on secondary sources comprising of Annual reports and Handbook of Insurance Regulatory Development Authority (IRDA), reports of National Sample Survey, various articles and research papers etc.

Overview of Health Insurance in India:

Performance of Health Insurance in India:

Initially, Government was enjoying the monopoly over health insurance market but, with the liberalization of Indian economy and enactment of Insurance Regulatory Development Act in 1999; private and foreign players were allowed to enter into the health insurance business.²¹ Health Insurance business has been growing in India. During 2015-16, the gross health insurance premium collected by general & health insurance companies was Rupees 24,448 crore and achieved a growth rate of 21.7 percent in gross premium which was the highest reported in the past five years.²²

Table 1: Health Insurance Premium over the last Five years (Rs.Crore)

Sectors	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Public Sector General Insurers	8015 (61%)	9580 (62%)	10841 (62%)	12882 (64%)	15591 (64%)	19227 (63%)
Private Sector General Insurers	3445 (27%)	4205 (27%)	4482 (26%)	4386 (22%)	4911 (20%)	5632 (19%)
Stand Alone Health Insurers	1609 (12%)	1668 (11%)	2172 (12%)	2828 (14%)	3946 (16%)	5532 (18%)
Industry Total	13,069	15,453	17,495	20,096	24,448	30392

Source: Annual Report of IRDAI 2015-16 and 2016-17.^(10,21) Note: Figures in the bracket of the table indicate the market-share in total HI premium.

From, the above Table 1, it is seen that the four public sector general insurance companies continued to contribute a major share at 63 percent of total health insurance premium in 2016-17. Standalone health insurers have also contributed 18 percent of total health insurance premium in 2016-17, registering an increase of 2 percent over the previous year 2015-16. But, there is a drop in the share of private general insurers, whose share has come down from 20% in 2015-16 to 19% in 2016-17. The increasing share of both the Public sector

General Insurers and Standalone health insurers over the past six years might be because of offering the health insurance product at a subsidized price. The health insurance industry in terms of total premium growth has been on a rapid progress and the reasons behind this can be termed as Medical inflation. The private sector insurance companies have also raised the premium per insured to compensate for the high medical bills and also it is the effect of asymmetric information on the part of the insurer where the companies raise the price of the policies.¹

Table 2: Categorization of Health Insurance Premium (Rs. Crore)

Class of Business	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Government Sponsored Schemes including RSBY	2225 (17%)	2348 (15%)	2082 (12%)	2474 (12%)	2425 (10%)	3090 (10%)
Group Business (other than Government business)	6948 (46%)	7186 (47%)	8058 (46%)	8899 (44%)	11621 (48%)	14718 (48%)

Cont... Table 2: Categorization of Health Insurance Premium (Rs. Crore)

Individual Business	4896 (37%)	5919 (38%)	7355 (42%)	8772 (44%)	10353 (42%)	12584 (42%)
Grand Total	13,069	15,453	17,495	20,096	24,448	30392

Source: Annual Report of IRDAI 2015-16, 2016-17.^(10,21) Note: Figures in bracket indicate the share of each class of business in total health insurance premium

The above table 2 shows that the Government sponsored health insurance business remains the lowest with 10% share in insurance premium. Most of the Government schemes do not require premium payment and again those which require is of very negligible. But, there has been a massive declining trend in Government health insurance premium which may be due to fierce competition between the insurance companies. Again, problems like information asymmetry and lack of awareness aggravates the matter.²

Table3: Percentage distribution of person by coverage of health expenditure support

	Not covered	Government funded insurance schemes	empl. (not Govt.) supported health protection	Arranged By household with insurance company	Others	All
Rural	85.9	13.1	0.6	0.3	0.1	100
Urban	82.0	12.0	2.4	3.5	0.2	100

Source: NSSO 71stroundreport

It is seen that, around 86% of rural households and 82% of urban households of India were still not covered under any scheme public or private, to support health expenditure. Lack of awareness, refusal of treatment by empanelled hospitals to BPL in many cases etc. are the main reasons behind poor coverage. Mostly in rural areas, the problem tends to be more prominent.

Table 4: Coverage of Persons under Health Insurance (Rs. Lakh)

Class of Business	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Government Sponsored Schemes including RSBY	1612 (76%)	1494 (72%)	1553 (72%)	2143 (74%)	2733 (76%)	3350 (77%)
Group (other than GOVT. Business)	300 (14%)	343 (17%)	337 (15%)	483 (17%)	570 (16%)	705 (16%)
Individual Business	206 (10%)	236 (11%)	272 (13%)	254 (9%)	287 (8%)	320 (7%)
Grand Total	2118	2073	2162	2880	3590	4375

Source: Annual Report of IRDAI 2015-16, 2016-17.^(10,21) Note: Figures in bracket of the table indicate the share of each class of business in total number of persons covered

The Table 4 shows that, the percentage of coverage of person under Government sponsored health insurance

schemes is more than that of private insurance schemes. Adverse selection, moral hazard and lack of awareness are the major reasons for the private individual business still in the grim of poor scenario.⁶

Table 5: Net Incurred Claims Ratio of Health Insurers (in percent)

Class of business	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Government sponsored schemes including RSBY	90%	87%	93%	108%	109%	122%
Groups (other than Govt. Business)	100%	104%	110%	116%	120%	125%
Individual Business	85%	83%	83%	81%	77%	76%
Grand total	94%	94%	97%	101%	102%	106%

Source: Annual Report of IRDAI 2015-16 and 2016-17.^(10,21)

From the above table, it is observed that there has been an increase in the net ICR from 94% in 2011-12 to 106% in 2016-17. The main factor responsible for this is adverse selection or poor risk identification. It is also seen that, in most of the cases members converting outpatient procedures as inpatient, resulting in Healthcare spending of population with insurance is thrice that of the population without insurance.¹¹

Challenges:

During 2015-16, the General and other health insurance companies have issued around 1.18 crore health insurance policies covering 35.90 crore persons, which is less than one-fifth of India's population and the underlying reason behind this poor coverage is due to lack of awareness or poor insurance literacy.² Moreover, Lack of proper health infrastructure, sufficient regulation on providers and inefficient TPAs, poverty, importance, lack of product variety etc are mainly responsible for the backwardness of this sector.

Suggestions

Rising premium resulting from High medical costs can be dealt with some measures like Hospital bills to be controlled through Health Management Organisation (HMO) and transparency to be initiated with the help of developed IT infrastructure which will help in increasing efficiency to reduce operating cost. Government must develop efficiency with respect to various publicly sponsored schemes so as to face the competition from the various new and innovative private individual and group insurance schemes. Rural population face greater risk of being in unhealthy condition due to lower access to sanitation and pure drinking water and inside house pollution arising out of the smoke from coal or wood used as fuel. Moreover, they also face the financial hardship to cure any illness etc. Facilitating and enhancing Micro Insurance for the disadvantaged people in rural and backward areas is really important. Creating more awareness regarding health insurance and making all insurance providers proper responsible in delivering their services should be the prime focus of both the insurers and Government of the country. Again, to increase the

health insurance penetration, Agents and private players must target new markets in rural and semi-urban areas. Moreover, Introduction of new product portfolios is also the need of the hour. TPAs in Insurance have to be more effective, so that the whole system of insurance can be made clear and efficient while dealing with the problem like information asymmetry.

Since, Insurance acts as a protection to high unexpected healthcare costs so initiatives must be taken so as to facilitate Public-Private Partnership in a competitive environment.

Conclusion

In the backdrop of escalating population, the Health Insurance as a tool of advanced healthcare financing play an indispensable role. Although, India has the highest potential for Health Insurance, the penetration still remains lowest when compared to western economies. Challenges remains are like the prevalence of high informal sector, adverse selection, moral hazard, lack of awareness and so on. The health insurance premium is in the increasing growth path which is mainly the result of high cost healthcare services. Poor coverage in health insurance mainly in rural areas shows the problem of lack of awareness regarding health insurance advantages. Again, high incurred claim ratios mainly in case of group business really hint to the matter of rising adverse selection and fraudulent cases in this industry. In such a situation Regulations and managed insurance market can play an effective role in moving health financing towards greater equity. Enhancement of Health Insurance industry with the help of Mass Marketing strategies like- Micro health insurance for the poor people, promotion of group insurance will be greatly helpful. All the stakeholders" like- healthcare providers, TPAs, Insurance agents, Insurance companies, Government and consumers must play a cohesive role towards increasing the health insurance penetration and density in India.

Ethical Clearance - Not applicable

Source of Funding - Self

Conflict of Interest - Nil

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Impact of Automobile Emission on Pulmonary Function Parameters of Non-Smoking Road Side Vendors and Shopkeepers

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Abstract

Background: Airborne dust plays a major part in the overall atmospheric pollution and motor vehicle emissions constitute the most significant source of ultra particle in urban environment. Traffic related air pollution is an occupational health hazard to individuals who work close to traffic.

Objectives: To assess the impact of dust and traffic related air pollution on pulmonary functions of the exposed, non-smoking road side shopkeepers at busy traffic congested areas and to compare with age and sex matched non-smoking shop keepers from residential localities.

Materials & Method: Cross-sectional study was conducted on 60 healthy adults aged 20-40 years. 30 shopkeepers exposed to dust and traffic pollution residing nearer to busy road-crossings of Vijayapura city. Control group is 30 age and sex matched non-smoking, non-exposed healthy subjects who are working in shops away from the road traffic pollution. Anthropometric parameters, Physiological Parameters, Pulmonary function test were recorded in both control and subjects using standard techniques. Statistical analysis is done using SPSS.

Results: We observed a significant reduction of FVC [subjects-2.63±0.40, control- 2.63±0.40, (p=0.03)] and FEV1 [subjects-2.47±0.59, control- 1.75±0.42, (p=0.000)] and an insignificant reduction of PEF [subjects-506.00±34.07, control-488.66±27.89, (p=0.610)] among the road side shopkeepers.

Conclusion: The results of the study indicate the possibility of impaired lung function or obstructive lung disorders among the shopkeepers exposed to higher traffic pollution.

Keywords: Automobile emission, FEV1, FVC, PEF, shopkeepers, traffic air pollution

Introduction

It is well documented that air pollution is associated with a number of respiratory and cardiovascular adverse health effects.⁽¹⁾ Air pollution generated by motor

vehicle exhaust has become a major cause of scientific and public concern world-wide. The rapid and marked increase in motor vehicular traffic and its associated gaseous pollutants in the urban areas have caused a sharp increase in prevalence of respiratory allergies.⁽²⁾ Road traffic produce volatile organic compounds, suspended particulate matter, oxides of sulphur, oxides of nitrogen and carbon monoxide which makes adverse health effects on exposed population.⁽³⁾ Airborne dust plays a major part in the overall atmospheric pollution and motor vehicle emissions constitute the most significant source of ultra particle in urban environment. Traffic related air

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pollution is an occupational health hazard to individuals who work close to traffic. Shopkeepers nearer to various traffic junctions through which maximum numbers of vehicles pass and they are more prone to develop health hazards of automobile exhaust on respiratory system.⁽⁴⁾

In a study by Kunzli et al. (2000)⁽⁵⁾ estimated that in European countries France, Switzerland and Austria, with a total population of 74 million inhabitants, 3% of total mortality per year (i.e. 20,000 deaths) are due to traffic emissions alone; hypothetically total omission of traffic emissions would lead to prolonged life expectancy of 0.35 years.

Areas with increased Ozone and automobile exhaust had a higher prevalence of asthma in all regions. The results of the study by Schmitz Berger *et al.*, (1993)⁽⁶⁾ provide evidence that outdoor pollution is a risk factor for childhood respiratory health.

Many studies suggest that there is an adverse effect on health following exposure to traffic pollution. No such studies have been carried out in this part of the country particularly on busy road side shopkeepers.

Vijayapura is one of historic and fast growing city of Northern Karnataka (India). The growth is associated with an enormous increase in vehicular traffic emitting exhaust and polluting the atmosphere. City pollution is entirely due to automobile exhausts as main city has no industries which can be blamed for air pollution of city.

Many studies have been carried out to examine the relationship between lung functions and exposure to traffic pollution in traffic policemen. But in India least studies done to know the effects of air pollution on residents, shopkeepers or school children who are residing in close proximity with busy road crossings and exposed to dust and traffic pollution. In view of this, our study is aimed to assess the effects of dust or possible traffic pollutants on pulmonary functions of road side shopkeepers.

Materials & Method

Cross-sectional study was conducted on 60 healthy, non-smoking male individuals in age group of 20-40 years who are residents of Vijayapura city since 15 years or more.

In order to study the impact of vehicular pollution on pulmonary functions, 30 individuals who are shopkeepers (book stall, provisional stores, juice centres, ice-cream parlours, vegetable stalls, chat centres, fruit stalls etc) and exposed to dust and traffic pollution for about 8-10 hours daily have been selected. These subjects were residing along busy road (2-3 kms long) passing besides BLDE (Deemed to be University) campus and connecting to NH-13, a connecting road between Vijayapura (Karnataka) and Solapur (Maharashtra) where approximately 1200-1500 vehicle pass per hour.

Control group included 30 healthy, non-smoking male shopkeepers from residential area which is away from the busy roads (where about 10-20 vehicles pass per hour) and they were from same socio-economic group and have similar life style as that of subject group.

With 5% level of significance and power of test 90%, the anticipated mean difference of FEV1 as 1.34% between comparison groups and anticipated distendable deviation as 1.4, the minimum sample size per group is 28, hence we have incorporated the sample size as 30 per group.

Institutional Ethical Committee clearance and consent from the participants were obtained.

Following thorough history taking and general physical examination, the individuals with history of smoking, heart/pulmonary disorders, musculoskeletal abnormalities, obese and malnourished individuals, drivers and shop keepers of drug stores, vehicle repair shops, were excluded from the study.

The Anthropometric parameters like Height (cms) and Weight (kgs) were measured. Using these parameters Body Surface Area (BSA) and Body Mass Index (BMI) were calculated.

Physiological parameters like Respiratory rate (cycle/min), Heart rate (beats/min) and Blood Pressure (mmHg) were recorded using standard techniques.

Pulmonary function parameters recorded were FVC (L), FEV1(%) & PEF (L/min). FVC & FEV1(%) were recorded using computerized spirometer- 'SPIROEXCEL', PEF was recorded using Mini Wright's Peak flow meter. The testing was performed in the relaxed sitting position after adequate demonstration,

motivation and encouragement.

Statistical analysis was done using SPSS version 16.0. Mean and Standard Deviation (SD) of all parameters was taken. Unpaired t-test was applied to know the statistical significance.

Results

Table I: Anthropometric and Physiological parameters of both control and study groups.

Parameters	Control group (n=30)	Study group (n=30)	P-value
Age (years)	32.43 + 5.59	30.00+4.21	0.062
Height (cms)	165.53+7.52	165.03+7.46	0.797
Weight (Kgs)	66.46+10.74	63.23+9.07	0.213
Body Surface area (Sq m/m ²)	1.72+0.15	1.70+0.18	0.710
Body Mass Index (Kg/m ²)	24.43+3.96	22.98+3.08	0.119
Pulse rate (Beats/min)	84.30+13.29	77.73+11.78	0.048*
Systolic Blood Pressure (mm Hg)	123.93+10.79	123.66+9.29	0.919
Diastolic Blood Pressure (mm Hg)	78.66+9.05	76.40+8.05	0.310

*P<0.05- significant, ***P<0.001-very highly significant

Table I shows the comparison of anthropometric and physiological parameters in residential and traffic exposed shop keepers. It can be seen that there is a statistically significant difference in the pulse rate of control and study groups however, both the values are within normal range. No statistical changes in BMI and BSA of both study and control group of our investigation suggest similar nutritional and socio-economic status.

Table II: Pulmonary function parameters of both control and study groups

Parameters	Control group (n=30)	Study group (n=30)	P-value
FVC (L)	2.90+0.53	2.63+0.40	0.03*
FEV1 (%)	84.97+13.89	67.61+16.85	0.000***
PEFR (L/min)	506.00+34.07	488.66+27.89	0.610

*P<0.05- significant; ***P<0.001-very highly significant.

Table II shows comparison of pulmonary function tests in control and study group. The results show variations in the lung parameters (FVC, FEV1(%), and PEFr) among the traffic exposed shopkeepers and residential shopkeepers. FVC and FEV1(%) of traffic exposed shopkeepers are found to be significantly lesser when compared to residential shopkeepers. These observations indicate possibility of obstructive lung disorders in case of shop keepers exposed to traffic pollution.

Discussion

Our observations of significant reduction of FVC and FEV1(%) and insignificant reduction of PEFr in road side shopkeepers exposed to traffic pollution were very much corroborated with observations of Ingle and Wagh in their study on shopkeepers working near national highway in Jalgaon⁽⁵⁾.

Ingle et. al. (2005)⁽⁷⁾ reported decrease in lung efficiency in the shopkeepers exposed to traffic pollution. Significant reduction in the lung capacity was observed in the higher age group of residential people living along the highway roadside. The forced expiratory volume in one-second (FEV1) and peak expiratory flow rate (PEFR) of exposed residential population was significantly affected as compared to control.

Jeelaniet al. (1992)⁽⁸⁾ reported reduced PEFr in the Kashmiri population than healthy western population due to anthropogenic, environmental, genetic and socioeconomic factors. This study concludes that the traffic policemen are highly vulnerable for respiratory impairment due to vehicular exhaust at workplace environment.

Emissions from road transport are the primary source of health hazardous pollutants, such as nitrogen oxides and carbon monoxide, and a significant source for fine particulate pollution. Exposures to these emissions are typically non voluntary and represent serious risk to human health.⁽⁹⁾

Decrease of FVC and FEV1 (%) in our study group indicates possible lungs and airway inflammation by automobile emissions. Diesel exhaust particles (DEP) emitted from automobiles capable to adsorbed organic hydrocarbons thought to consist of a carbon core

surrounded by trace metals, such as nickel, and its salts. A number of these components have shown inflammatory effects in the lungs of laboratory animals^(10, 11).

Conclusion

The results of the study indicate reduction in the lung function efficiency among the shopkeepers exposed to higher traffic pollution. The forced expiratory volume in one-second (FEV1) and Forced Vital Capacity (FVC) of exposed residential population was significantly affected as compared to control group who are residing away from higher traffic pollution.

Emphasis has to put on preventive aspects rather than on diagnosis and management of respiratory diseases. Hence protective mask wearing and reduction in timing of work shifts will help in reducing the exposure to air pollutants.

Conflicts of Interest: Nil

Limitation: Detailed information on air pollutants of the study area would have helped to understand the issue better.

Acknowledgement: The authors are thankful to Indian Council of Medical Research (ICMR), New Delhi for financial assistance.

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State of Ethical Issues in Published Literatures: A Non-Systematic Review

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Abstract

Introduction: Research ethics govern the standards of conduct for scientific researchers. It is important to adhere to ethical principle to protect the dignity, rights and welfare of research participants. According to ICMR National ethical guidelines for biomedical research involving human participants should be conducted in accordance with the basic and general ethical principles. The researcher and the team are responsible for protecting the dignity, rights, safety and well-being of the participants enrolled in the study. They should have the appropriate qualifications and competence in research methodology and should be aware of and comply with the scientific, medical, ethical, legal and social requirements of the research proposal. All research involving human beings should be reviewed by an ethics committee to ensure that the appropriate ethical standards are being upheld. The importance of ethics in clinical research has been well-established for many decades. A growing attention is given to determine the best ethical practices for conducting observational and experimental studies.

Methods: A non-systematic review was performed of existing published articles in three different journals for normative ethics literature which includes Institutional ethical clearance, informed consent, assent and voluntary participation of the study participants.

Results : A total of 315 articles published in 3 different journals between 2014 and 2018 demonstrated that informed consent was obtained in 80% of articles and institutional ethical clearance was obtained in 88% of articles.

Conclusions: Ethical conduct is important for any sphere of life in medical research and publication as they directly affect the humanity. No research activity involving human subjects can be conducted and proceed unless informed consent is completely sought.

Key words: *Ethical issues, Informed ethical consent, Institutional ethical clearance.*

Introduction

Research is the pillar of knowledge, and it constitutes an integral part of progress. In the

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fast-expanding field of biomedical research, this has improved the quality and quantity of life. Research that involves human subjects or participants raises unique and complex ethical, legal, social, and political issues. Research ethics specifically deals with the analysis of ethical issues that are raised when people are involved as participants in research.

The Indian Council of Medical Research (ICMR) issued the Policy Statement on Ethical Considerations Involved in Research on Human Subjects in 1980^[1]. Due to rapid advances in biomedical science and technology,

new ethical dimensions emerged which necessitated further updation of these guidelines. Subsequently the Ethical Guidelines for Biomedical Research on Human Subjects was released in 2000,^[2] followed by the revised Ethical Guidelines for Biomedical Research

on Human Participants in 2006^[3]. In the meantime, the Central Drugs Standard Control Organization (CDSCO) also released the Indian Good Clinical Practice Guidelines (2001)^[4] for clinical trials and revised Schedule Y of the Drugs and Cosmetics Act, 1940, in the year 2005^[5] with several amendments in the Rules under Drugs and Cosmetics Act in the year 2013. ICMR and the Department of Biotechnology (DBT) jointly brought out Guidelines for Stem Cell Research and Therapy in 2007 and a further revision in 2013 which is now revised as National Guidelines for Stem Cell Research, 2017^[6].

The code of conduct for physicians was well laid out in traditional Indian systems of medicine and do no harm was the underlying universal principle besides other principles applicable to the prevalent culture and the class systems of the society. Research ethics govern the standards of conduct for scientific researchers. It is important to adhere to ethical principle to protect the dignity, rights and welfare of research participants. According to ICMR National ethical guidelines for biomedical research involving human participants should be conducted in accordance with the basic and general ethical principles. The researcher and the team are responsible for protecting the dignity, rights, safety and well-being of the participants enrolled in the study. They should have the appropriate qualifications and competence in research methodology and should be aware of and comply with the scientific, medical, ethical, legal and social requirements of the research proposal. All research involving human beings should be reviewed by an ethics committee to ensure that the appropriate ethical standards are being upheld. The importance of ethics in clinical research has been well-established for many decades. A growing attention is given to determine the best ethical practices for conducting observational and experimental studies.

Informed consent protects the individual's autonomy to freely choose whether or not to participate in the research. The Nuremberg Code makes it clear that voluntary consent of the human subject is absolutely

essential for research^[7]. The process involves three components—providing relevant information to potential participants, ensuring the information is comprehended by them and assuring voluntariness of participation. Informed consent should be in a language that can be understood by the participants and it also should explain medical terminology in the research in simple terms. The informed consent document (ICD), which includes patient/participant information sheet (PIS) and informed consent form (ICF) should be reviewed and approved by the EC before enrolment of participants.

There are no available studies regarding documentation of these basic ethical practices followed during descriptive epidemiological studies.

Indian Journal of Community Medicine (IJCM), Indian Journal of Public Health (IJPH), Indian Journal of Community Health (IJCH) are three peer-reviewed national journals which are widely read by public health professionals and which publishes novel and interesting descriptive studies. Hence these three journals were chosen and reviewed for the documentation of ethical practices in their articles which is published between period of 2014 and 2018.

Method

A non-systematic review was performed of existing published articles in three different journals viz. Indian Journal of Community Medicine (IJCM), Indian Journal of Public Health (IJPH), Indian Journal of Community Health (IJCH) between 2014 and 2018 for normative ethics literature which includes Institutional ethical clearance, informed consent, assent and voluntary participation of the study participants. Descriptive epidemiological studies were only included for the study.

Statistical Analysis

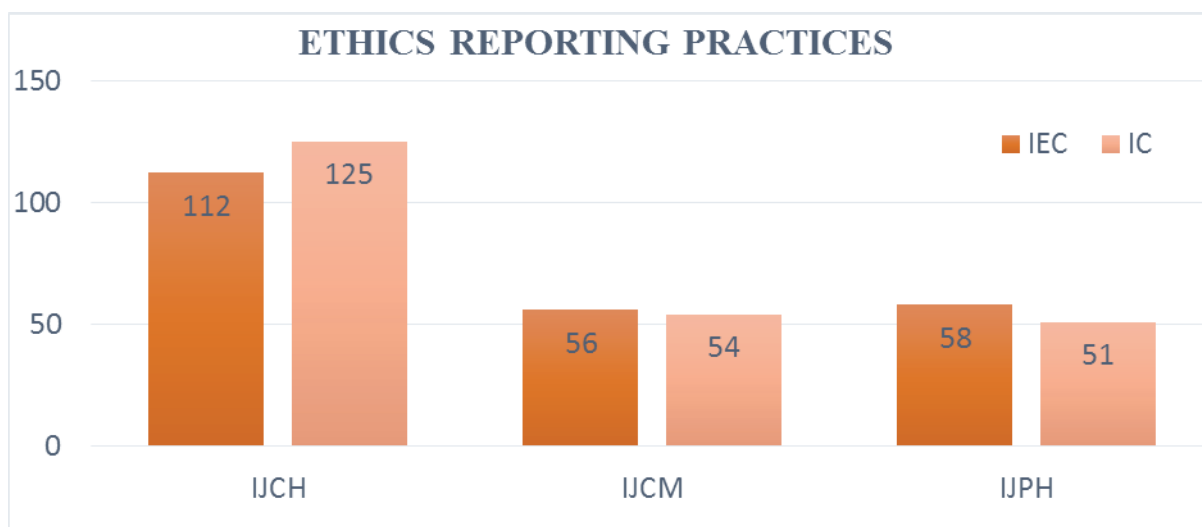
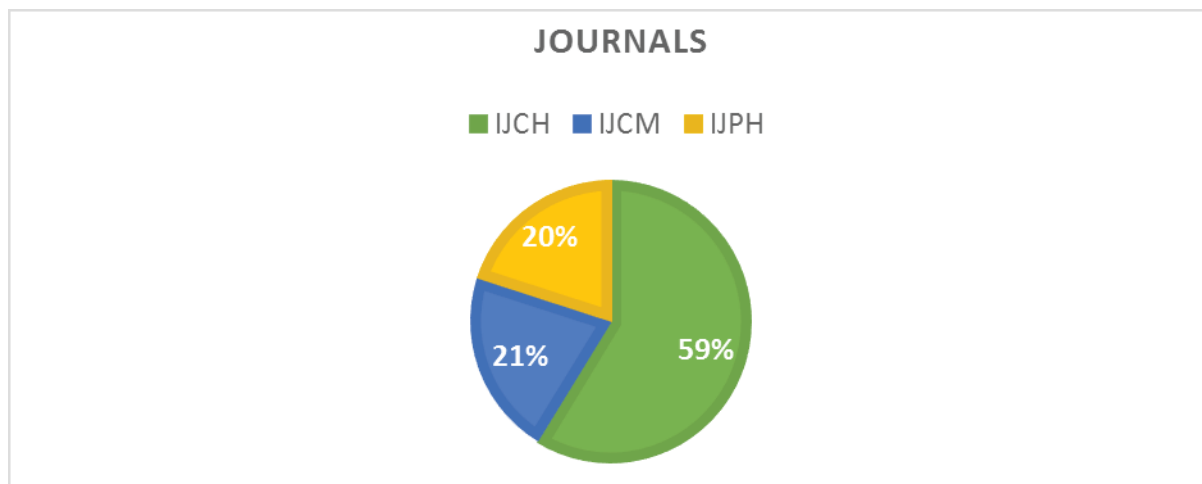
The number of research articles mentioning about ethical clearance, informed consent, and assent in case of children were expressed in terms of descriptive statistics.

Data is expressed as proportions with 95% confidence interval (CI).

Results

A total of 315 articles published in 3 different

journals between 2014 and 2018 was reviewed for the study.



2014			
JOURNAL	NO. OF ARTICLES	IC	IEC
IJCH	81	54 (66.7%)	41(50.6%)
IJCM	03	03(100%)	02(66.7%)
IJPH	07	05(71.4%)	06(85.7%)
2015			
IJCH	52	38(73.1%)	33(63.5%)
IJCM	15	13(86.7%)	10(66.7%)
IJPH	10	10(100.0%)	09(90.0%)
2016			
IJCH	18	11(61.1%)	14(77.8%)

Cont.... Table

IJCM	17	12(70.6%)	13(76.5%)
IJPH	10	08(80.0%)	09(90.0%)
2017			
IJCH	20	14 (70.0%)	16(80.0%)
IJCM	11	08(72.7%)	11(100.0%)
IJPH	18	15(83.3%)	17(94.4%)
2018			
IJCH	14	08(57.1%)	08(57.1%)
IJCM	21	18(85.7%)	20(95.2%)
IJPH	18	13(72.2%)	17(94.4%)

Informed consent was documented in 230 articles (73.01%) out of 315 articles reviewed. In IJCH of 185 articles reviewed 125 (67.6%) articles reported informed consent from study participants. In IJCM of 67 articles reviewed 54 articles (80.6%) were mentioned about written consent from the participants. In IJPH of 77 articles reviewed 59 articles (76.6%) reported getting informed consent.

Institutional ethical clearance was obtained in 230 articles (71.74%) out of 315 articles reviewed. In IJCH of 185 articles reviewed 112 articles (60.5%) got ethical approval from the Institute. In IJCM of 67 articles, 56 articles (83.6%) mentioned obtaining Institutional ethical clearance. In IJPH of 77 articles reviewed 66 articles (85.7%) obtained ethical approval.

Discussion

Out of 315 articles reviewed, 226 (71.74%) articles mentioned about ethical approval from Institutional ethical committee and 230 (73.01%) mentioned about informed consent which is higher when compared to previous studies.

Chaturvedi et al. (2009) reviewed 157 articles from the Indian Journal of Psychiatry and reported that, informed consent was mentioned in 51% of studies in 2000, which gradually rose to 82% in the year 2007 and ethics committee approvals were mentioned in 2% of studies in 2000, which rose to 28% in the year 2006 and

25% of reports in 2007.

Belhekar et al. (2014) reviewed 673 articles from four national journals and found only 163 (24.2%) articles mentioned about ethical approval and 179 (26.5%) articles mentioned about informed consent.

Sabapathy SS et al. reviewed Indian physiotherapy journals from which ethical committee clearance was mentioned in 14 out of 73 studies (19.2%); informed consent was obtained in 38 out of 68 studies (55.9%), assent in 3 out of 6 studies (50%).

It is evident that practice of reporting informed consent and Institutional ethical clearance has been increased when compared to previous study results. It is also observed that there is only minimum change in reporting ethical practices over four years.

Properly documented review and approval from a formally constituted review board (national or institutional review board or ethics committee) for all studies involving humans, medical records, and human tissues/organs were required in most of the journals. But we can see from this study only around 70% of published articles were reported about consent and ethical clearance from the institute which focus on the need for stronger direction on bioethical issues in publication. Journal editors are important for the publication of scientific documents. They should

encourage authors to meet the standards as stated in guidelines and should reject research not meeting these requirements. Editors should explain the importance of ethical protection to reviewers, readers, and researchers and publish those papers that show them as important criteria in research. Though many journals including those in the study provide guidance on information to be provided regarding ethical approval and informed consent in their Instructions to Authors, it appears that these requirements are not always adhered to by authors. Journal editors should introduce effective mechanisms to ensure that this information is reported for all research conducted on human participants. It shows there is a need to train journal reviewers by editors themselves; so that, the reviewers can guide the authors at the time of review of their research articles.

Conclusions

Ethical conduct is important for any sphere of life in medical research and publication as they directly affect the humanity. No research activity involving human subjects can be conducted and proceed unless informed consent is completely sought.

Key words

Ethical issues, Informed ethical consent, Institutional ethical clearance.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Yes – Institutional ethical clearance obtained

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Analysis of Physical Parameters in Pre-Obese Women- An Observational Study

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Abstract

Objective: To analyze the physical parameters in pre-obese women.

Methods: A total of 100 pre-obese women between the age group 40-59 years were randomly selected, to analyze physical parameters in them. Pre-obese was categorized according to the BMI classification (BMI- 25-29.99). Outcome measures used for assessment included physical fitness tests such as curl ups for abdominal endurance, push ups for upper body endurance, squat test for lower body endurance. For assessing upper body muscular strength free weight flat bench press was selected and to assess lower body muscle strength leg press test was selected. Sit and reach test was performed to assess flexibility. Then we observed the physical parameters scores in pre-obese women with the normal ranges.

Result: 27% of the women showed poor muscle flexibility, 45% women showed poor results for abdominal endurance, 33% showed poor results for upper body endurance, 3% women gave poor results for lower limb endurance. 17% women showed poor results for upper body muscle strength and 3% women showed poor results for lower body muscle strength.

Conclusion: On the basis of the results of this study, it can be concluded that, the lower body muscular strength and lower limb endurance was found to be normal but flexibility, upper limb muscle strength and upper limb muscle endurance was found to be poor among these pre-obese women.

Key words: physical parameters, physical fitness, pre-obese.

Introduction

With the recent development incidence of obesity is increasing dramatically among general population.¹ The prevalence of obesity has been increasing worldwide which is 39% in adults with ratio indicating that women are more likely to be obese than men.² Prevalence of obesity is 38% for males and 40% for female respectively also, prevalence for obese and pre-obese found out to be 29.7% in India.^{2,3} It is found out that 12.7% of women are pre-obese in India.⁴

It is necessary to quantify obesity; the method used to quantify obesity may include Body Mass Index (BMI). It can be calculated by dividing an individual's weight measured in kg by their height in meters squared (kg/m^2)⁵ This index is independent of age and gender.⁵

According to the classification of BMI individuals who have score ranges between 18.50-24.99 are rated as normal, >25 are overweight, 25- 29.99 are pre-obese and above 30 considered as obese.²

A variety of factors such as poor diet, genetic predisposition, physical inactivity, advancing technology, sedentary life, physiological and behavioral factors which are implicated as contributing factors to obesity.⁶ Body mass index (BMI) has been shown to be an important predictor of risk of non communicable diseases.³ There are various negative effects of obesity on health which are hypertension, type 2 diabetes mellitus, stroke, dyslipidemia, osteoarthritis, cancer, cardiovascular diseases, respiratory system problems and on mental health.⁷

Physical fitness is defined as “the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies.” There are few components which can measure physical fitness are endurance, muscle strength, flexibility, agility, speed, balance.⁸

Muscular endurance is defined as “a health related component of physical fitness that relates to the external force that a muscle can exert” Muscular endurance is also known as local endurance. It is the ability of a muscle to contract repeatedly against a load, generate and sustain tension, and resist fatigue over an extended period of time. The important components of muscular endurance test are low- intensity, muscle contractions, a large number of repetitions, and a prolonged time period. So, muscular endurance can be assessed by partial curl-up test, push up test, sit ups, etc.¹⁶ Cardiopulmonary endurance is also known as total body endurance. It is associated with repetitive, dynamic motor activities such as walking, cycling or upper extremity ergometry, which involve use of the large muscle of the body. Different types of test like 6-minute walk test, 12-minute walk test, treadmill test, etc. is used to find out the functional status of respiratory, cardiovascular, and skeletal muscle systems.¹⁶

Muscle strength is “a health related component of physical fitness that relates to the amount of external force that a muscle can exert.” Muscular strength can be assessed either statically or dynamically. Static strength can be assessed by variety of devices including cable tensiometers and handgrip dynamometer. The 1-repetition maximum (1-RM) has been the standard for dynamic strength assessment which includes different methods like bench press, leg press, etc.¹⁷ Flexibility is “a health related component of physical fitness that relates to the range of motion available at a joint.”¹⁸

A cross sectional study was done on obesity, physical fitness and activity levels in Cree children, they concluded that there was a high prevalence was found of overweight in population, with low physical activity and fitness level.¹⁴ Another study was done on physical fitness and physical activity in obese and non-obese youth they concluded that obese subjects had poorer performances in various tasks e.g sit up, bent arm,

shuttle run, endurance shuttle run as compared to non-obese subjects and they had higher sport index than their obese counterparts.¹⁵

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Exercise is a subcategory of physical activity which is structured, repetitive and purposeful.¹⁰ If the person is weak, dull, and sick and he is not able to do his work efficiently and quickly. A well balanced exercise program can improve general health, endurance and also enhances emotional well being. Any healthy person may become physically unfit if he is not doing exercise regularly.¹⁰

There are certain physiological changes occurred in body in response physical activity. Physiological changes triggered by exercises includes increased requirement for oxygen and substrate in skeletal muscle are increased, as are the removal of metabolites and carbon dioxide. Along with this certain chemical, mechanical and thermal stimuli which alters the metabolic, cardiovascular and ventilator function in order to meet this increased demands.¹¹

There are various pharmacological and non-pharmacological therapies used for treatment of obesity to stay physically fit but pharmacological treatments may leads to adverse effect on body. Regular exercises maintain the physical fitness, reduce stress and enhance the mental health. Regular physical activity increases the amount of oxygen delivered to the brain, which increases capacity to do work and allows oxygen flow to the brain enables one to cognitively functions.¹³

The purpose of the study is to observe the physical parameters in pre-obese women. Moreover no study till date hence, it is necessary to study physical fitness parameters among pre-obese women.

Materials and Methodology

Study design: Observational study, sample size- 100, Place of study- Krishna hospital and medical research centre, karad, sampling method- simple random sampling, study duration- 3 months

Participants:

Inclusion criteria: 100 subjects including women

of age group 40-59years and pre- obese women with BMI score between25-29.99 were taken in the study.

Exclusion criteria: Women with psychological ailments, undergone surgery in past or pain in past 3 months, any physical injury, subjects with history of smoking, heart and lung diseases were excluded from the study.

Outcome measures: Outcome measures were recorded after the physical fitness tests were done.

1-Body Mass Index

2- Partial curl ups (abdominal endurance)

3- Maximal push ups (upper body muscle endurance)

4- Squat test (lower body muscle endurance)

5- Free weight flat bench press(upper body strength)

6-C:\Users\rksharma\Downloads\Leg press.docx
Leg press (lower body strength)

7-Sit and Reach Test (Flexibility)

Procedure: Subjects fulfilling the inclusion and exclusion criteria were included. Informed consent form was taken from each of the subjects prior to the physical fitness tests. The motive and procedure of the study was thoroughly explained to the subjects. Instructions were given to subjects about the physical fitness tests.

Their BMI were taken in order to categories them under pre-obese. To check physical parameters physical fitness tests were done which may include curl ups for abdominal endurance,push ups for upper body endurance, squat testto check lower body endurance. To check upper body muscle strength free weight flat bench press was taken and to check lower body muscle strength leg press test was taken. Sit and reach test was done for flexibility. Then we observed the physical parameters scores in pre-obese women with the normal ranges. Then data was collected and analyzed. And after that statistical analysis was done.

Results

1. Flexibility-

i) Sit and reach test

Table no.1: Interpretation: This table shows that statistically 27% pre-obese women showed poor results for muscle flexibility in sit and reach test.

Age	Findings	Frequency	Percentage
40-59	Excellent	2	2%
	Very good	10	10%
	Good	15	15%
	Fair	27	27%

2. Endurance-

i) Curl ups (Abdominal endurance)

Table no.2: Interpretations: This table shows that statistically 45% pre-obese women showed poor results for abdominal endurance in curl ups test.

Age	Findings	Frequency	Percentage
40-49	Very good	10	10%
	Good	45	45%
	Fair	45	45%

ii) Pushups (Upper limb endurance)

Table no.3: Interpretation: This table shows that statistically 33% pre-obese women showed poor results for upper limb endurance in pushups test.

Age	Findings	Frequency	Percentage
40-59	Very good	24	24%
	Good	43	43%
	Fair	33	33%

iii) Squat test (Lower limb endurance)

Table no.4 : Interpretation: This table shows statistically 3% pre-obese women showed poor results for lower limb muscle endurance in squat test.

Age	Findings	Frequency	Percentage
40-59	Excellent	1	1%
	Good	25	25%
	Above average	23	23%
	Average	21	21%
	Below average	27	27%
	poor	3	3%

4. Muscle strength

i) Flat bench press (Upper limb muscle strength)

Age	Findings	Frequency	Percentage
40-49	Excellent	5	5%
	Good	11	11%
	Average	46	46%
	Fair	21	21%
	Poor	17	17%

Table no.5 :Interpretation: This table shows that statistically 17% pre-obese women showed poor result for upper limb muscle strength in flat bench press test.

ii) Leg press (Lower limb muscle strength)

Table no.6: Interpretation: This table shows statistically 3% pre-obese women showed poor results for lower limb muscle strength in leg press test.

Age	Findings	Frequency	Percentage
40-49	Excellent	4	4%
	Good	37	37%
	Average	45	45%
	Fair	13	13%
	Poor	3	3%

Discussion

With the recent development incidence of obesity is increasing dramatically among general population.¹ It is found out that worldwide prevalence of obesity is 39% in adults with ratio indicating that women are more likely to be obese than men.² It has been reported that prevalence of preobese women is 12.7% in India. A variety of factors such as poor diet, genetic predisposition, physical inactivity, advancing in technology, sedentary life, physiological and behavioral factors which are the contributing factors for obesity.⁶

In the current study, 100 women between age group 40-59 years fulfilling the inclusion criteria were included. From which 54 subjects were between the age group of 40-50 and 46 subjects were between the age group of 50-59 years respectively. Women who are categorized under pre-obese according to the B.M.I classification (BMI- 25-29.99) were included in the studies.

The aim of our study was to analyze the physical parameters in pre-obese women such as muscle flexibility, abdominal and muscular endurance and muscle strength. Flexibility is a health related component of physical fitness that relates to the range of motion

available at a joint.¹⁸ Sit and reach test was used to check the flexibility in pre-obese women. Statistically the present study showed that, there were 27% of women showing poor results, 15% were good, 10% were very good and 2% gave excellent results.

Muscular endurance is defined as a health related component of physical fitness that relates to the external force that muscles can exert.¹⁶ curl ups test was used to check the abdominal endurance, the present study noted that 45% women showing poor results, 45% were good and 10% were very good. Push ups test was used to check the upper limb endurance, the result was found in which 33% showed poor results, 43% were good and 24% gave very good results. To check the lower limb endurance squat test was used and statistically the present study showed that, there were 3% women gave poor results, 27% were below average, 21% were average, 23% were above average, 25% were good and 1% gave excellent results.

Muscle strength is a health related component of physical fitness that relates to the amount of external force that a muscle can exert.¹⁷ Flat bench press test was used to check the upper limb strength; statistically the present study showed that 17% women showed poor results, 21% were fair, 46% were average, 11% were good and 5% women gave excellent result. Leg press was used to check the lower limb muscle strength in which the present study showed 3% women were poor, 13% were fair, 43% were average, 37% good and 4% were gave excellent results.

A study was done on physical fitness and physical activity in obese and non-obese youth. Physical fitness was assessed by the European physical fitness test battery and activity was assessed by modified version of Beacke questionnaire. They concluded that obese subjects had poorer performances in various tasks e.g sit up, bent arm, shuttle run, as compared to non- obese subjects and they had higher sport index than their obese counterparts.¹⁵

A study was done by Carmina N.G, Marshall D, Willows N on obesity, adiposity, physical fitness and activity levels in creechildren. objectives of the study were to describe the levels of obesity, adiposity, physical activity and fitness in cree children. The study concluded that there was a high prevalence of overweight in this

population with low physical activity and fitness levels.¹⁴

A study was done on effect of 2 year physical education program on physical activity and fitness in elementary school students. In which they evaluated health related physical education program for fourth and fifth grade students designed to increase physical activity during physical education classes. Result was found that physical education curriculum provides more physical activity during physical education classes.¹⁹

At the end in our study, we concluded that lower limb strength and lower limb endurance was found normal but flexibility, upper limb muscle strength and upper limb muscle endurance was poor among pre-obese women between the age of 40-59 years.

Conclusion

On the basis of this study, it was concluded that lower limb strength and lower limb endurance was found to be normal but flexibility, upper limb muscle strength and upper limb muscle endurance was poor among pre-obese women between the age of 40-59 years.

Authors Contribution:

Manali B. Badave: conducted literature review for this manuscript, developed introduction section of the manuscript together with the discussion of the study findings, collected data and analyzed the data. Dr.GVardharajulu: Provided a description of the background information and participated in preparation of manuscript.

Ethical Clearance: Ethical clearance was taken from institutional ethics committee of Krishna Institute of Medical Sciences deemed to be university, Karad.

Source of Funding: This study is funded by Krishna Institute of Medical Sciences Deemed to be University, Karad.

Conflict of Interest: The authors declare that there are no conflict of interest concerning the content of the present study.

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A Study to Evaluate the Effect of Proprioceptive Neuromuscular Facilitation Stretching on Balance and Gait in Spastic Diplegic Cerebral Palsy: An Interventional Study

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Abstract

Background: Cerebral Palsy is a static, non-progressive disorder that results from brain insult or injury during any of the prenatal, perinatal and postnatal stages. Proprioceptive neuromuscular facilitation integration pattern stimulates the proprioceptors with in the muscle and tendon to enhance the performance, flexibility and balance. It is generally effective in maintaining the reaction of exercise unit by increasing the co-ordination which react to the stimulation in muscular strength and flexibility. **AIM:** To evaluate the effect of Proprioceptive neuromuscular facilitation Stretching on balance and gait in spastic diplegic cerebral palsy.

Method: Total 30 Spastic diplegic cerebral palsy subjects were assessed as per Selection criteria of the study. Consent form taken from children's parents. They were randomly divided into group-A (n=15) and group-B (n=15). spastic diplegic cerebral palsy were assessed for baseline outcome measures Pediatric berg balance, WeeFIM scale ,10 Meter walk test on day 1 and after 4 week.

Group-A was given conventional treatment and Propioceptive neuromuscular facilitation stretching which include hold -relax and contract- relax for 6-second hold and 10 repetitions for 5 days/week for 4 weeks.

Group-B was given conventional treatment. Statistical analysis was done using SPSS Software.

Conclusion: Neuromuscular facilitation stretching along with conventional therapy is more effective to improve the balance and gait in spastic diplegic cerebral palsy.

Keywords: spastic diplegic cerebral palsy. Proprioceptive neuromuscular facilitation technique, Gait, Balance

Introduction

“Cerebral” refers to the brain, and “Palsy” refers to muscle weakness/poor control. Cerebral palsy (CP) is a term used to describe a problem with posture and movement that makes certain activities difficult. Someone who has cerebral palsy has problems moving his or her muscles; this is not because of muscles or nerves, these

difficulties are caused because of problems in the brain.¹ Cerebral palsy is a well-recognized neurodevelopment condition beginning in early childhood and persisting through the lifespan.²

These disorders are attributed to nonprogressive disturbances that occurred in the developing infant brain or fetal. The motor disorders of CP are often accompanied by disturbances of perception, sensation, cognition, communication, and behavior, by epilepsy and by secondary musculoskeletal problems.³

The spastic CP type is described by exaggerated deep tendon reflexes, increased muscle tone, muscle weakness, and gait affection. Nearly 70–77% of CP

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cases were spastic CP.⁴ Spastic diplegia (SD) is a motor impairment in the upper extremities as well as the lower extremities. The constrained capacity to generate force result in activity limitation more than the spasticity did.⁶

In spastic diplegic children, abnormal gait patterns can result from disturbance of balance, muscle weakness, spasticity and skeletal deformities.^{7,8}

These patterns are characterized by lack of mobility in the lumbar spine, pelvis and hip joints and show asymmetric pelvic motion during walking. A lot of the ambulatory children with spastic diplegia were able to attain a walk in the form of a crouch gait with flexed hips, knees and ankles.⁹

The overall pooled prevalence of cerebral palsy per 1000 children surveyed was 2.95 (95% CI 2.03–3.88). Sub-group analysis for rural, urban and mixed rural-urban study population demonstrated the pooled prevalence as 1.83 (95% CI 0.41–3.25), 2.29 (95% CI 1.43–3.16) and 4.37 (95% CI 2.24–6.51) respectively.¹⁰

Proprioceptive neuromuscular facilitation integration pattern stimulates the proprioceptors with in the muscle and tendon to enhance the performance, flexibility and balance. It is generally effective in maintaining the reaction of exercise unit by increasing the co-ordination which react to the stimulation in muscular strength and flexibility.

The facilitated progression due to PNF procedures follows a hierarchical process from mobility to stability then controlled mobility to skillful movement. Studies have stated that PNF stretching is effective in improving muscle strength, flexibility, posture coordination and gait.

Method

- **Study Design:** interventional Study
- **Study Setting:** Morbi City
- **Sampling Technique:** Purposive Sampling
- **Study Population:** Spastic diplegic cerebral palsy
- **Sample Size:** 30 Subjects
- **Study Duration:** 6 months

Selection Criteria:

Inclusion Criteria:

- Children diagnosed as Spastic Diplegic cerebral palsy.
- Age bsetween 5-12 years and both gender.
- Gross motor function level I and II.
- Written consent from their parents.
- Spasticity range between 1 and 1+ grade according Modified Ashworth scale.
- Able to follow simple verbal instructions.

Exclusion Criteria:

- Uncooperative subjects.
- Uncontrolled epilepsy.
- Receiving botulinum toxin injections or surgery no earlier than 6 months before project start.
- Presence of shortening or deformities of the ankle, knee and/or hip joints that prevented the children from keeping their feet on the ground.

Procedure:

The proposal is approved by Ethical clearance for the study was obtained from the Ethics Committee, School of Physiotherapy, RK University and CTRI (Clinical trial registry – India).

Written consent was taken from subjects' parents who fulfilled selection criteria and were willing to participate in the study.

On the first visit, spastic diplegic cerebral palsy was assessed for baseline outcome measure WeeFIM, Pediatric berg balance and 10 meter walk test.

Group A (n=15): conventional Physiotherapy and Proprioceptive neuromuscular facilitation stretching which include hold -relax and contract- relax for 6-second hold and 10 repetitions and 2 minutes rest in between, for 5 days/week for 4 weeks.

Group B (n=15): conventional Physiotherapy.

Result

Data Analysis:

Descriptive statistics were used to describe sample characteristics. The significance level selected was 0.05.

Statistical Analysis:

All the statistical analysis was done by statistical package for the social science (SPSS) Statistical software version 21.0 for windows. The pre and post value were collected from both the group before and after intervention. Statistics was performed by using the

following statistical tests:

For, Pediatric Balance Scale and WeeFIM:

Intra Group: Wilcoxon signed-rank Test

Inter Group: Mann-Whitney U Test

For, 10MWT:

Intra Group: Paired T Test

Inter Group: Un-paired T Test

TABLE 1: GROUP A INTRAGROUP ANALYSIS

OUTCOME	MEAN		SD		T/Z Value	P Value
	Pre	Post	Pre	Post		
PBS	29.80	32.20	1.69	1.82	Z Value=3.456	0.001
WeeFIM	77.46	79.20	2.89	3.028	Z Value=3.341	0.001
10MWT	0.498	0.433	0.0013	0.015	T Value=5.727	0.000

The mean average for PBS improved from 29.80(pre) to 32.20(post). Similarly, for WeeFIM the mean average improved from 77.46(pre) to 79.20(post) and for 10MWT mean average improved from 0.498(pre) to 0.433(post). As per data reflects that P value is lesser than 0.05 which shows significant difference in PBS, WeeFIM and 10MWT IN Group A.

TABLE 2: GROUP B INTER GROUP ANALYSIS

OUTCOME	MEAN		SD		T/Z Value	P Value
	Pre	Post	Pre	Post		
PBS	30.53	30.60	2.29	2.38	Z Value=0.332	0.739
WeeFIM	80.40	80.20	1.88	1.52	Z Value=0.690	0.590
10MWT	0.049	0.059	0.049	0.052	T Value=0.332	0.924

The mean average for PBS from 30.53(pre) to 30.60(post) was not significantly improved. Similarly, for WeeFIM the mean average was not improved from 80.40(pre) to 80.20(post) and for 10MWT mean average from 0.049(pre) to 0.059(post) was not significantly improved. As per data reflects that P value is more than 0.05 which shows significantly not improved in PBS, WeeFIM and 10MWT.

TABLE 3: INTRA GROUP ANALYSIS

OUTCOME	MEAN		SD		Z Value	P Value
	Group A	Group B	Group A	Group B		
PBS	4.66	0.66	1.496	0.798	4.546	0.000
WeeFIM	5.26	0.200	2.016	1.146	3.3451	0.000
10MWT	0.052	0.050	0.0065	0.0045	4.253	0.001

The mean average for PBS is 4.66(post) and 0.66(post) respectively for group A and B. similarly for WeeFIM the mean 5.26(post) and 0.200(post) for group A and B. and the mean average for 10MWT is 0.52(post) and 0.050(post) respectively for group A and B. As per data reflects that P value is lesser than 0.05 which shows significant difference between both groups.

Discussion

The results of the present study showed that conventional physical therapy and Proprioceptive neuromuscular facilitation stretching is more effective to improve Gait, Balance and Functional independence in spastic diplegic cerebral palsy. Thus, the null hypothesis is rejected.

The probable mechanism by which PNF could have worked is by facilitating the neuromuscular mechanism, by stimulating the proprioceptors.

PNF increases the ROM by increasing the length of muscle and the neuromuscular efficiency. The physiological mechanism for increasing the ROM and strength may be due to autogenic inhibition, reciprocal inhibition, and stress relaxation so, it helps to lengthening the contracted structures, relax the hypertonic muscles, initiating the movements, strengthening the weak muscles and improving the control of the pelvis.

The reason for better balance and lower extremity function in PNF group may be due to the way it utilizes the different proprioceptive information for stimulating nerve and muscles function by utilizing distinct helical form pattern which is based on functional components to aid reaction of motor system located in muscles and

joints, and turn human movements into patterns for various uses such as exercise intervention. Improvement of balance ability might have resulted from facilitation of proprioceptive sense, leading to change in various supports leads to increase in stability of joints.

PNF have various exercises aim to improve stability and mobility components, once the desired stability components are achieved it mobility component further helps to improve function.

Logeshwari Selvaraj [2018] conducted study in which Proprioceptive Neuromuscular facilitation technique on trunk were Trunk exercise and PNF techniques was perfume on spastic hemiplegic cerebral palsy and concluded that the PNF technique exercises improved significantly better performance in their activities of daily living.

Chandan Kumar [2016] conducted study on Comparison between Task - Oriented Training and Proprioceptive Neuromuscular Facilitation Exercises on Lower Extremity Function in Cerebral Palsy. Concluded that both Task-Oriented Approach and Proprioceptive Neuromuscular Facilitation Exercises are beneficial in improving lower extremity function in children with cerebral palsy.

Further recommendation:

- Study can be done with other type of PNF technique
- Study can be done on other type of cerebral palsy or on other type of neurological conditions like stroke.

Conclusion

This study concluded that proprioceptive neuromuscular facilitation stretching along with conventional therapy is more effective to improve the balance and gait in spastic diplegic cerebral palsy patients.

Source of Funding: Self

Conflict of Interest: Nil

TRI No: CTRI/2019/09/021236

Ethical Clearance: Ethics committee, RK university.

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Metabolic Syndrome: Prevalence of Its Components in Post Menopausal Females

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Abstract

Introduction: Metabolic syndrome is a cluster of metabolic abnormalities characterized by abdominal obesity, hyperglycemia, decreased high density lipoprotein (HDL), increased Triglycerides and high blood pressure, which predispose the individual at higher risk for both cardiovascular disease (CVD) and type 2 diabetes. Postmenopausal state is considered as a vulnerable period for developing MS.

Aims and Objectives: To study the Prevalence of metabolic syndrome and its components in postmenopausal women.

Material and Method: This study was conducted in the Department of biochemistry, MMIMSR, MMDU, Mullana, Ambala. A total of 100 postmenopausal women in the age group of above 45 years were recruited for this study after assessing their eligibility according to the selection criteria.

Biochemical Investigations: Estimation of Fasting Serum glucose was done on Erba chem 7 analyzer and Total cholesterol, HDL and Serum Triglycerides was done on Dimension® clinical chemistry system manufactured by Siemens Healthcare Diagnostics (US).

Results: The mean triglycerides and fasting serum glucose levels were significantly high (<0.001) among postmenopausal women with metabolic syndrome. Overall prevalence of metabolic syndrome was 29%.

Conclusions: Evaluating the biochemical parameters in postmenopausal women is useful for assessing the risk of developing metabolic syndrome in them. Monitoring the health status of these females can help to reduce the Prevalence of metabolic syndrome and thus the risk of developing cardiovascular disease.

Keywords: Metabolic syndrome, Postmenopausal, Components, Cardiovascular, Triglycerides

Introduction

Metabolic syndrome (MS) is a cluster of metabolic abnormalities characterized by abdominal obesity, hyperglycemia, decreased high density lipoprotein

(HDL), increased triglycerides and high blood pressure, which predispose the individual at higher risk for both cardiovascular disease (CVD) and type 2 diabetes. [1] In 2001, The Third Report of National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) (ATP III) emphasized the importance of the metabolic syndrome and provided a working definition of this syndrome for the first time. [2] Postmenopausal state is considered as a vulnerable period for developing MS, and this increased risk has been attributed to decreasing estrogen levels with an increasing risk of insulin resistance

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following menopause.^[3,4] The Metabolic syndrome in postmenopausal women, in particular, needs to be given adequate attention as early as possible followed by an aggressive approach toward prevention and management. There is high prevalence of abdominal obesity, hypertension, diabetes, lipid abnormalities, and metabolic syndrome in India.^[5] Obesity correlates strongly with multiple coronary risk factors, of which it is an important determinant.^[6]

Aims and Objectives

To study the Prevalence of metabolic syndrome and its components in postmenopausal women.

Material and Method

This study was conducted in the Department of Biochemistry, MMIMSR, MMDU, Mullana, Ambala. 100 postmenopausal women in the age group of above 45 years visiting MM Super speciality hospital were considered in our study. Postmenopausal women were considered having metabolic syndrome if they had any three or more criteria of Modified National Cholesterol Education Program Adult Treatment Panel III [NCEP ATP III criteria].^[2]

Exclusion Criteria

A woman on hormone replacement therapy, with secondary hypertension and history of smoking and alcoholism were excluded from the study.

Sample Collection:

A venous blood sample was collected from all the subjects who came after 8–12 h overnight fast and was sent for fasting serum glucose, triglycerides, total cholesterol and high-density lipoprotein (HDL) cholesterol.

Biochemical Investigation

Estimation of Fasting serum glucose was done by Glucose oxidase (GOD) and Peroxidase (POD) method on Erba chem 7 analyzer.^[7] Total cholesterol,^[8] HDL,^[9] and Serum Triglycerides was done by enzymatic method^[10] on Dimension® clinical chemistry system manufactured by Siemens Healthcare Diagnostics (US).

Statistical Analysis

All the data were analyzed by using the SPSS version 20. Values were presented as Mean \pm standard deviation (SD). To test the significance between the study group and the control groups analysis was done by a student's t- test. The p-value ($p < 0.05$) was significant.

Results

A total of 100 postmenopausal women were studied. There were 29 Postmenopausal woman who were found to have metabolic syndrome. Table 1 shows Comparison of biochemical parameters of post-menopausal females with metabolic syndrome and without metabolic syndrome. The mean Fasting serum glucose levels were higher in the postmenopausal women with metabolic syndrome (142.76 ± 42.55) compared to the postmenopausal women without metabolic syndrome (99.63 ± 25.36) and the difference was statistically highly significant ($p < 0.001$). The mean total cholesterol levels were higher in the postmenopausal women with metabolic syndrome (177.55 ± 41.19) compared to the postmenopausal women without metabolic syndrome (165.92 ± 43.18) but the difference was statistically not significant (0.218). The mean serum triglycerides levels were higher in the postmenopausal women with metabolic syndrome (202.24 ± 41.30) compared to the postmenopausal women without metabolic syndrome (137.46 ± 48.11) and the difference was statistically highly significant ($p < 0.001$). The mean HDL cholesterol levels were lower in the postmenopausal women with metabolic syndrome (36.52 ± 7.17) compared to the postmenopausal women without metabolic syndrome (41.06 ± 15.69) but the difference was statistically not significant (0.139). Overall prevalence of the metabolic syndrome among postmenopausal women was 29%. The percentage prevalence of components of metabolic syndrome i.e. fasting blood sugar ≥ 100 mg/dl, Triglyceride ≥ 150 mg/dl, High-density-lipoprotein-cholesterol < 50 mg/dl, , waist circumference ≥ 80 cm, and systolic blood pressure ≥ 130 mmHg/diastolic blood pressure ≥ 85 mmHg are presented in Table 2. The percentage of these components of metabolic syndrome among postmenopausal women were 18%, 20%, 12%, 22% and 19% respectively.

Discussion

In the present study, 29% of the total 100 postmenopausal females had metabolic syndrome. Study by Deibert et al [11] showed that the Prevalence of metabolic syndrome among postmenopausal women was 36.1%.

On comparing the postmenopausal women with metabolic syndrome with postmenopausal without metabolic syndrome, it was found that mean BMI, waist circumference, systolic blood pressure and diastolic blood pressure was significantly higher in postmenopausal women with metabolic syndrome.

Study by Lobo (2008) suggested that weight increase and obesity greatly increase the Prevalence of metabolic syndrome among postmenopausal women. Changes in central obesity can cause metabolic abnormality and influence health. [12] There is a fall in the estrogen secretion among postmenopausal women resulting in assemblage of abdominal fat. Increase in systolic blood pressure and diastolic blood pressure is suggestive of risk of cardiovascular disease in postmenopausal females with metabolic syndrome.

Our study showed an increase in Fasting serum glucose, Triglycerides and a fall in High-density lipoprotein levels in postmenopausal women with metabolic syndrome. There are different studies about the menopausal effect on above biochemical parameters. Studies by Peter et al [13], and Davis et al [14] showed no effect of menopause on Triglycerides while studies by

Jensen et al [15] and Bergman et al [16] had findings similar to our study. There was a fall in High-density lipoprotein levels in postmenopausal with metabolic syndrome. It has been reported that deposition of Triglycerides leads to lipotoxicity which may be associated with β - cell dysfunction and insulin resistance.[17] Hypertriglyceridemia stimulates the enzymatic activity of cholesterol ester transfer protein, which facilitates the transfer of Triglycerides from Triglyceride – rich Lipoproteins (Chylomicrons and Very- low- density Lipoproteins) to High- density lipoprotein and Low-density lipoprotein in exchange for Cholesteryl esters [18] leading to increase in Triglycerides content of High-density lipoprotein and Low- density lipoprotein .

Kreisberg et al [19] showed that reduction in High-density lipoprotein levels should be taken as a risk factor for coronary heart disease among postmenopausal females. High waist circumference and increased triglycerides levels were the most common components of metabolic syndrome in postmenopausal females in our study. This is suggestive of an increase in the risk of cardiovascular disease in postmenopausal females with metabolic syndrome.

Conclusion

Evaluating the biochemical parameters in postmenopausal women is useful for assessing the risk of developing metabolic syndrome in them. Monitoring the health status of these females can help to reduce the Prevalence of metabolic syndrome and thus the risk of developing cardiovascular disease.

Table 1: Comparison of biochemical parameters of post-menopausal females with metabolic syndrome and without metabolic syndrome.

Parameter	Post-menopausal women with metabolic syndrome (Mean \pm S.D.)	Post-menopausal women without metabolic syndrome (Mean \pm S.D.)	p value	Significance
Fasting serum glucose (mg/dl)	142.76 \pm 42.55	99.63 \pm 25.36	<0.001	HS
Total Cholesterol (mg/dl)	177.55 \pm 41.19	165.92 \pm 43.18	0.218	NS
Triglycerides (mg/dl)	202.24 \pm 41.30	137.46 \pm 48.11	<0.001	HS
HDL(mg/dl)	36.52 \pm 7.17	41.06 \pm 15.69	0.139	NS

Table 2: Prevalence of metabolic syndrome and its components in post-menopausal females.

	Number	Percentage (%)
Metabolic Syndrome	29	29%
Fasting serum glucose ≥ 100 mg/dl	18	18%
Triglycerides ≥ 150 mg/dl	20	20%
High-density-lipoprotein-cholesterol < 50 mg/dl	12	12%
Waist circumference ≥ 80 cm	22	22%
Systolic blood pressure / Diastolic blood pressure ≥ 130 mmHg / ≥ 85 mmHg	19	19%

Source of Funding – Self**Conflict of Interest - Nil****References**

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Sociodemographic Characteristics of Pregnancy Induced Hypertension: An Observational Study in the Kolhapur Population

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Abstract

Backgrounds: Pregnancy Induced Hypertension (PIH) is the foremost cause of maternal and neonatal mortality. Research suggests PIH is associated with different socio-demographic parameters. However, there is a paucity in the data regarding the socio-demographic characteristics of pregnancies affected by hypertension. This study aimed at evaluating socio-demographic characteristics of PIH in Kolhapur district, Maharashtra.

Materials and Method: Pregnant women (n=150) with Blood Pressure >140/90 mm of Hg after 20 weeks of gestation and willing to give consent were included. Those not willing for follow up, patients with history of obesity, chronic hypertension, coronary heart disease were excluded. Data collection was done using pre-designed, pre-tested questionnaire comprising of questions on sociodemographic parameters. Association between variables was calculated by chi square test and P-values < 0.05 were considered significant.

Results: Mean age of the participants was 22.57 ± 3.68 years, 81% suffered from mild PE (n=122) and 62% were primiparas (n = 93). 97% of them belonged to the rural background, and most of them were literate (n=107, 71.33%). 52% (n=82) belonged to Class I status. Neonatal outcome was normal in most (n=137), preterm births (n=18), intrauterine growth restriction (IUGR) (n=31), in neonatal intensive care unit (NICU) (n=15). Sociodemographic parameters and PIH showed no association.

Conclusion: Primipara women had higher incidence of pregnancy induced hypertension. However, pregnancy induced hypertension did not seem to have any association with the socio-demographic variables.

Keywords: Blood Pressure, Hypertension, intrauterine growth restriction

Introduction

Pregnancy related hypertension (PIH) is classically defined as a condition where systolic blood pressure (SBP) >140 mm of Hg and a diastolic blood pressure

(DBP) >90 mm of Hg is diagnosed.⁽¹⁾ As per the Canadian Hypertension Society, PIH can be referred to any one of pre-existing hypertension, gestational hypertension and Pre-eclampsia (PE), pre-existing hypertension with gestational hypertension and proteinuria and unclassifiable hypertension.⁽²⁾

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PE and eclampsia are the primary culprits of maternal and perinatal mortality and morbidity. PIH is known to affect about 6-10% of all pregnancies.⁽³⁾ Most common pathologies related to PE are haemolysis, elevated liver enzymes and low platelet count (HELLP) or partial HELLP syndrome. Furthermore, haemorrhagic stroke and pulmonary oedema have been

reported as the primary causes of mortality in eclamptic women. ⁽⁴⁾ Other maternal short-term complications include dysfunction of the central nervous system, acute disseminated intravascular coagulation (DIC), cerebrovascular events, hepatocellular injuries, oliguria, pulmonary oedema, placental abruption, and thrombocytopenia. ⁽⁵⁾ Complications associated with PE are more prominent when in early-onset (<32 weeks of gestation) PE as compared to late-onset PE. ⁽⁶⁾ Women with PIH are predisposed to several other conditions such as hypertension, cardiovascular disease (CVD), diabetes mellitus and renal diseases later in life. ⁽⁷⁾

PIH is the most prevalent cause of maternal death in Europe. ⁽⁸⁾ It was third among the leading causes of maternal deaths in a tertiary centre in India. ⁽⁹⁾ Savitz et al showed that women who were Hispanic and Black were at a higher risk of PIH compared to white women. A reduced risk was seen in Asian women. The study also suggested a positive correlation between pre-pregnancy weight and risk of PIH. ⁽¹⁰⁾

There have been previous studies in India which have demonstrated associations of PIH with several biochemical and haematological parameters. ^(11,12) However, studies relating to PIH with socio-demographic variables are rare. As it is known that PIH is affected by socio-demographic variables, there is a need to study this aspect of PIH across different regions of India, and thereby developing strategies to prevent it. ⁽¹³⁾ Here, we studied the socio-demographic characteristics of women suffering from PIH in tertiary care centre in Kolhapur district of Maharashtra.

Methods

The prospective observational study was undertaken at the Department of gynaecology and obstetrics, at a tertiary care hospital, Kolhapur, for a period of two years. A total of 150 women were selected by random sampling method and enrolled in the study, post the approval from the institutional ethical committee. An informed and written consent was obtained from them. All pregnant women with BP>140/90 mm of Hg after 20 weeks of gestation and giving consent were included in the study. Those not willing for follow up, patients with history of obesity, chronic hypertension, coronary heart disease, impaired renal failure, Smokers and alcoholics were excluded.

The data was collected using predesigned and pretested questionnaire comprising of two parts. The first part had details of socio demographic characteristics like name, age, residence etc. Second part included the general physical and detailed systemic examination findings. Sociodemographic variables were classified based on modified Kuppuswamy classification. ⁽¹⁴⁾ Severity of PIH were classified based on symptoms, signs, and other investigations.

The data was analysed on MS-Excel package 365. The qualitative variables were expressed in terms of percentages. Quantitative variables were categorised and expressed in terms of percentages or in terms of mean and standard deviations. Association between variables was calculated by chi square test. P-values below 0.05 were considered significant.

Results

The mean age of the participants in the study ranged from 18-32 years with a mean age of 22.57 ± 3.68 years. A significant number were ≤ 25 years of age ($P= 2.20e^{-16}$). There were 112 patients suffering from mild PE (SBP 140-149, DBP 90-99 mmHg), 24 from severe PE (SBP 150-159, DBP 100-109 mmHg) and 4 from eclampsia (SBP ≥ 160 and DBP ≥ 110 mmHg). Participants in the study group were classified according to their socio-demographic parameters in order to assess their impact on the incidences of PIH.

Majority of participants in the study were between 21-25 years of age ($n=66$), followed by women between 18-20 years. A significant proportion of the sample (62%, $n=93$) were primiparas ($P=5.31e^{-5}$) and 97.33% ($n=146$), belonged to rural background ($P=2.20e^{-16}$). There were 6% ($n=9$) of patients who had a history abortion, and 2.67% ($n=4$) had a history of still birth in the past.

The mean SBP was 149.11 ± 9.31 mm of Hg and mean DBP was 90.67 ± 2.50 mm of Hg. About 22.67% had SBP and 2% ($n= 3$) of them had more than 180 mm of Hg. Likewise, 6.67% ($n=10$) of the patients had diastolic blood pressure more than 100 mm of Hg in the present study. Maximum number of women were affected with mild PE ($n=122$, 81.33%), 24 had severe PE (16%) whereas 4 of them (2.7%) suffered from eclampsia.

More than half (54.67%, n=82), of the participants were of Class-I, i.e. upper class . A significant fraction of the sample was poorly educated (middle school or below, $P=3.47e^{-13}$). As many as 136 patients showed PIH related symptoms. The most common symptom was pedal oedema (n=40), followed by abdominal pain (n=31) and epigastric discomfort (n=22). A complete account of the symptoms has been depicted in figure 1. However, no association between PIH (PE and

eclampsia) and sociodemographic variables was noted. Chi-square test between PIH and the variables, returned a P-value >0.05 .

Most women had normal deliveries (91.33%, n=137), while 13 had Lower segment Caesarean section (LSCS). Mean birth weight of the babies was 2.57 ± 0.44 kgs. A total of 65 neonates (43.5%) presented complications (figure 2).

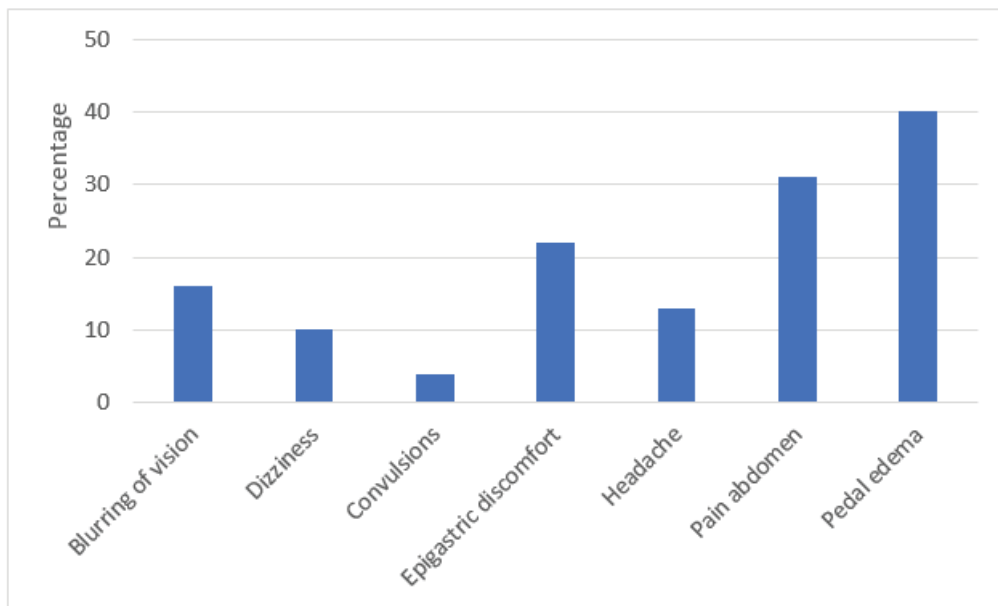


Figure 1. An account of the PIH symptoms in participants

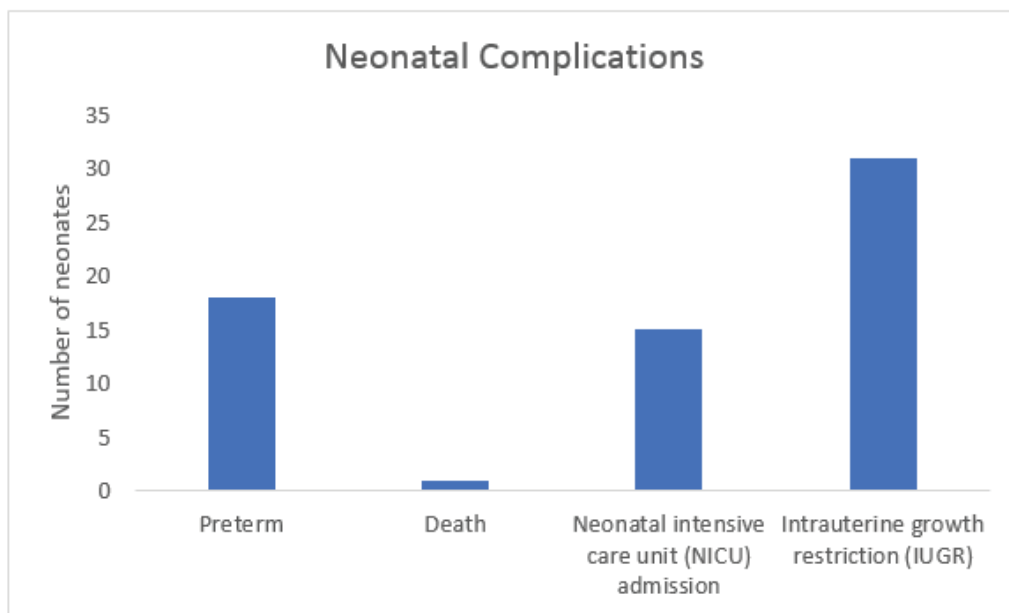


Figure 2. Distribution of neonatal complications

Discussion

PIH is one of the leading causes of foetal and maternal mortality all over the world. The estimates of the mortalities are much higher in developing countries of Asia (varying between 20-80 %), than the rest of the world.^(15,16) PIH is affected by a number of factors, sociodemographic being one of them. In India, the incidence of PE was estimated to be 8-10 % of the total pregnancies.⁽¹⁷⁾ Although, studies emphasizing the biochemical factors and PIH have been numerous, reports relating to the effect on socio-demographic variables have been few.^(12,18) As demographics can impact PIH, region-specific studies will help in preventive measures

Concurrent with the present study, the mean age of women in PIH group was 23.8 years in a study by Manjusha et al, in the Pune district of Maharashtra. Additionally, a significant number were ≤ 25 years ($P=2.20e^{-16}$).^(19, 20) However, in a particular study in north India by Mehta et al, incidences of PIH was found in women >25 years of age.⁽²¹⁾ In the present study, only 4.67% ($n=7$) were >30 years of age. This bias could be explained as a lesser prevalence of pregnant women above 30 years in the studied region. However, in Iran, a considerable number of participants were above the age of 35 years.⁽²²⁾ In a survey on maternal hypertension, there were 32% Chinese and Filipinos, 37% Koreans, and 49% Japanese mothers who were above 35 years suggesting ethnic differences between PIH age groups.⁽¹³⁾

PIH was classically proposed as a disease of the first pregnancy.⁽²³⁾ Herein, it is reported that a significant number ($P=5.31e^{-5}$) of women were primiparas (62%). This is consistent with several other previous studies who reported number of incidences of primiparas ranging from 52-73%.⁽¹⁹⁻²¹⁾ Previous literature suggests, risk of PE in primiparas in almost twice is higher than those in multiparas⁽²⁴⁾. However, a recent report also suggested that the data for the impact of parity in PE were conflicting and both nulliparas and multiparas were predisposed to PE risk⁽⁵⁾

Herein, a significant number of women ($P=2.20e^{-16}$) belonged to a rural background. A study by American Society of Nephrology states that women in rural areas have increased incidence of PIH.⁽²⁵⁾ Studies by Jena et al and Bangal et al also report similar findings in

the eastern and western regions of India respectively.^(26,27) Conflicting trends were reported for Africa where rural women in Nigeria .^(28, 29) Factors like poverty, poor availability of health care facilities and lack of awareness regarding PIH in the rural population could be responsible for the higher incidence of PIH in the rural population.

Likewise, education and socio-economic status has also been shown to be associated with the incidences of PIH.⁽³⁰⁾ A major population of women were poorly educated (middle school or below, $P=3.47e^{-13}$) although we did not find any significant association between education and PIH similar to Ramesh K et al.⁽²⁰⁾ In studies outside India illiterate and poorly educated women were seen to be at a higher risk of PIH.^(13,30) In India however, literate women are more predisposed to the risk of PIH and is explained by the rising levels of stress at work and college.^(21,20,30,31) This is also in part linked to the knowledge and awareness regarding their health issues and PIH in women. Many cases of PIH among illiterate women go unnoticed and unreported due to their ignorance.^(31,12) Likewise, low socioeconomic status has been linked to increased risk of PIH, which is in contrast this study, wherein a significant population despite belonging to the upper class suffered from PIH.^(12,31,20) As most patients belonged to the rural background, lack of proper healthcare facilities in spite of being economically sound, could be a plausible explanation for this.

As regards the symptoms, pedal oedema has been reported to be one of the main symptoms in patients with pregnancy induced hypertension, concurrent with our study. Other prevalent symptoms include headache and blurred vision and epigastric pain.⁽³²⁾ Patients suffering from PIH have also been shown to present several neonatal complications like IUGR, pre-term births and even death of the neonates in few cases.⁽³³⁾ Our study was in line with these and a considerable number of neonates had IUGR while a few were also preterm births.

Over-all the study demonstrated that PIH was more prevalent in women who are below 25 years, belong to rural areas, primipara and poorly educated. There seems to be a need to improve awareness among women about their health during pregnancy. Also, as a major part of India is covered by rural population, more

women healthcare centres at rural level are needed to be established to provide accessible healthcare facilities to these women in their locality. Our study provides a broad idea about the factors related to PIH. Similar studies with a larger sample size and/or multi-centres would be able to give a clearer picture of all the parameters affecting PIH.

Conflicts of Interest: The authors declare that they have no conflict of interest.

Funding Source: None

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Utilization of Antenatal Care Package among Women of Urban Slums

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Abstract

Background: Antenatal period is an essential phase in shaping health care of the nation. Complete antenatal package includes minimum of three antenatal visits, two tetanus toxoid injections during the pregnancy, or received one tetanus toxoid injection during the pregnancy and at least one in the three years prior to the pregnancy, and received iron and folic acid tablets for 100 days. Utilization of complete antenatal package is pivotal for every pregnant woman and is influenced by socio-demographic factors. **Objectives:** To study the pattern of utilization of antenatal care package and factors influencing it among pregnant women of urban slums. **Methods:** Cross sectional study was done and data was collected by house to house survey after taking consent, using a pre-designed and pre-tested proforma. **Results:** Majority of 40.44% were in the age group of 18-25 years, 36.89% had completed primary education and 53.78% belonged to lower socioeconomic class. 39.56% women had availed the complete ANC package. Primigravida, literates and homemakers had utilized complete ANC package more effectively. ($p < 0.05$) Utilization of the complete ANC package was less among lower socioeconomic status women and labourers. **Conclusion:** Though women had undergone antenatal visits regularly but there was disparity in utilizing the complete ANC package, which should be focussed and emphasized on a larger perspective so as to build a healthy motherhood.

Key words: Antenatal Package, Health-care, Literacy, Pregnant, Slum, Urban, Women.

Introduction

To attain Every Woman Every Child vision and the Global Strategy for Women's, Children's and Adolescents' Health, innovative, evidence-based approaches to antenatal care (ANC) is required. The World Health Organization (WHO) envisions a world where every pregnant woman and newborn receives quality care throughout the pregnancy, during childbirth and postnatal period. ANC imparts a key platform for health-care functions, which is defined as "the care

provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy." The components of ANC include risk identification, prevention and management of pregnancy related or concurrent diseases and health education and health promotion.¹

Global estimates indicate that only half of all pregnant women receive recommended amount of ANC package.² Nevertheless, the utilization of complete ANC package is not ubiquitous in India which was reflected during the National Family Health Survey 4 (NFHS-4), where only 21% of pregnant women had availed the services completely.^{2,3} In Karnataka, the utilization rates of full ANC care was 32.8% as per NFHS 4.⁴

Utilization of ANC services is of paramount importance for reducing maternal mortality in India.^{2,5,6}

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Each day in 2017, approximately 810 women died from preventable causes related to pregnancy and childbirth. Between 2000 and 2017, the maternal mortality ratio (MMR, number of maternal deaths per 100,000 live births) dropped by about 38% worldwide. 94% of all maternal deaths occur in low and lower middle-income countries. The MMR in low income countries in 2017 was 462 per 100 000 live births versus 11 per 100 000 live births in high income countries. Sub-Saharan Africa and Southern Asia accounted for approximately 86% (254 000) of the estimated global maternal deaths in 2017. Sub-Saharan Africa alone accounted for roughly two-thirds (196 000) of maternal deaths, while Southern Asia accounted for nearly one-fifth (58 000).⁷ In India maternal mortality accounts to 130/100,000 live births for the year 2014-16.⁸

WHO new antenatal care model increases the number of contacts/visits a pregnant woman has with healthcare providers throughout her pregnancy from four to eight. Focusing on a positive pregnancy experience, these new guidelines seek to ensure not only a healthy pregnancy for mother and baby, but also an effective transition to positive labour, childbirth and ultimately to a positive experience of motherhood.⁹

ANC is an essential component in the primary health care services of a country, which aims for a healthy society.¹⁰

Ensuring appropriate ANC services is of paramount importance in safeguarding maternal and newborn health, in India where health risks results from the vicious cycle of malnutrition, poverty as well as literacy status of the family.¹¹ In developing nations, though there is adequate provision of maternal health services but there is dearth in effective utilization. Thus, the present study was conducted with objectives of assessing the utilization of complete antenatal care package and the factors influencing in availing these services among pregnant women residing in urban slums.

Methodology

Study design:

A community based, cross-sectional study was conducted for a period of one year in the urban slums. The study was carried out by interviewing women in the

age group of 15-45 years, who delivered three months before the start of the study residing in urban slums, which is the field practice of Urban Health Training Centre attached to a tertiary care hospital.

Voluntary consent:

As the study was community based, the women were enrolled in the research after obtaining written informed consent on voluntary basis.

Sampling method:

The overall sample size was calculated as 225, using the formula $4pq/L^2$, where p is the prevalence 64% (According to World Health Organization, globally 64% of women receive ANC complete package)¹ q=1-p and L the permissible error, taken as 10%, the sample size worked out to be 225 at 5% alpha error. The total population of urban field practice area is 30,000. With an average family size of five members, 6000 families were residing in the study area. To achieve the required sample size, every 10th house was considered and only one woman from each family was included in the study, as she was considered to be representative of the selected family. Further for confirmation of the services utilized and to avoid recall bias, only those women were selected who had mother card with details of ANC and services availed.

Sampling procedure:

House to house survey was carried out by the investigators, by doing systematic random sampling (every 10th house was considered), if there was no study participant in the 10th house, then as per the procedure followed in systematic random method, the next houses were considered (i.e. 11th, 12th and so on). Later, as per the protocol systematic sampling method was continued considering 20th, 30th house and so on till the required sample size was achieved. Anganwadi workers and medico social workers played a pivotal role in establishing rapport with the study participants. One woman was selected from each house and she was considered as representative of the family. No other woman was selected from the same family, so as to avoid replication of the data and recall bias.

Inclusion and exclusion criteria: Women in the age group of 15-45 years, who had delivered three

months before the start of the study and residing in the study area for more than one year and who gave consent on a voluntary basis to participate in the study were included. Only the present pregnancy was considered for the study. Women who did not comply with the inclusion criteria were excluded.

Complete ANC package: Complete antenatal package includes those women who had a minimum of three antenatal visits, at least two tetanus toxoid injections during the pregnancy, or received one tetanus toxoid injection during the pregnancy and at least one in the three years prior to the pregnancy, and received iron and folic acid tablets for 100 days or more.⁷

Data collection:

A community based, cross-sectional study was conducted for a period of one year in the urban slums. Data was collected by interviewing 225 women in the age group of 15-45 years, who delivered three months before the start of the study using a pre-designed and pre-tested semi structured proforma, which included socio-demographic profile, and the various aspects of antenatal care. The questionnaire used in the study was translated to vernacular language and validated by the investigators. The data collection was restricted to the index pregnancy, to avoid recall bias and the mix-up of replies regarding earlier deliveries, if any. A house-to-house survey was done, case identification was carried out with the help of medical social and anganwadi workers equipped with the proforma. The case load was cross-checked to reassure that the cases were not missed. Data was collected after signing a written informed consent form on voluntary basis and confidentiality was assured.

Data analysis was done using SPSS software version 22.0. Descriptive statistics, Odds ratio and 95% Confidence interval were calculated. Chi-square test was applied to find an association between two attributes and $P < 0.05$ was considered as statistically significant.

Results

A total of 225 pregnant women participated in the study. The socio-demographic characteristics of the study participants were as follows. A majority of 40.44% were in the age group of 18-25 years. 72% of

the women belonged to Muslim community, 36.89% women had completed primary school education and 53.78% belonged to lower middle class socio-economic status [(SES), Modified B. G. Prasad's Classification 2019-India].¹²

Table.1, illustrates antenatal details of study participants, where in 60.44% women had registered their pregnancy at government hospital. Majority of the women 50.66% had registered their pregnancy in first trimester and 46.67% of women had taken 3 antenatal visits. Two doses of TT injection were taken by 72% women and intake of iron and folic acid with calcium tablets was recorded among 38.67% of the women.

Table 2 depicts the complete utilization of complete ANC package. It was noticed that 39.56% of the study participants had utilized the complete ANC package which included 3 or more visits, 2 TT injection doses, Iron and folic acid tablet intake for a minimum of 100 days.

Table 3 describes the association between socio-demographic characteristics and complete ANC package utilization. The utilization of complete ANC package among primigravida was 58.27% in contrast to 9.30% multigravida and was statistically significant ($\chi^2=53.29$, $df=1$, $OR=13.6164$, $95\% CI=6.1064-30.3628$, $p < 0.05$). This shows that primigravida were more apprehensive about the events occurring during ante natal period, so the utilization rate was higher in them. 61.41% of literates had used the complete ANC package when compared to 11.22% of illiterates, which was statistically significant. ($\chi^2=58.2863$, $df=1$, $OR=0.1613$, $95\% CI=0.0386-0.1635$, $p < 0.05$), connoting that education of the women played a significant role in availing the complete ANC package efficaciously. When socioeconomic class was considered, less than 50% of the study participants had utilized the complete ANC package who came from lower socio economic status. This shows that lower socioeconomic class women were not aware of the benefits of availing the complete ANC package. In the occupation category, 57.81% homemakers had used the complete ANC package in comparison to 10.98% pregnant women who were labourers and this difference was statistically significant. ($\chi^2=45.8595$, $df=2$, $OR=11.1152$, $95\% CI=5.1146-24.1562$, $p < 0.05$) ANC visits led to loss of daily wages of the labourers

and hence the package was not efficiently utilized by the women.

Table 1. Antenatal details of study participants (n=225)

Antenatal registration	Number	Percentage
First trimester	114	50.66
Second trimester	87	38.67
Third trimester	24	10.67
Gravida		
Primi	139	61.78
Multi	86	38.22
Place of registration		
Government hospital	136	60.44
Private hospitals/Clinics	21	9.33
Teaching hospitals	68	30.23
Antenatal visits		
1	12	5.33
2	88	39.11
3	105	46.67
≥4	20	8.89
Intake of IFA and Calcium (For a minimum of 100 days)		
Yes	87	38.67
No	138	61.33
TT doses		
1	63	28
2	162	72

Table 2. Complete Utilization of ANC Package of study participants (n=225)

Complete ANC Package (3 or more visits, 2 TT doses, Iron and folic acid tablet intake for a minimum of 100 days)		
ANC Package Utilization	Number	Percentage(%)
Utilized	89	39.56
Not utilized	136	60.44

Table 3: Comparison of Sociodemographic characteristics with ANC package utilization

Characteristics	ANC Complete Package		Chi-square	df	p value	Odds Ratio	95%CI of OR
	Utilized (n=89) (%)	Not utilized (n=136) (%)					
Literacy							
Illiterates (n=98)	11 (11.22)	87 (88.78)	58.2863	1	<0.00001*	0.0794	0.0386-0.1635
Literates (n=127)	78 (61.41)	49 (38.59)					
Gravida							
Primi (n=139)	81 (58.27)	58 (41.73)	53.29	1	< .00001*	13.6164	6.1064-30.3628
Multi (n=86)	08 (9.30)	78 (90.70)					
Occupation							
Homemakers (n=128)	74 (57.81)	54 (42.19)	45.8595	2	< .00001*	11.1152	5.1146-24.1562
Labourers (n=82)	09 (10.98)	73 (89.02)				2.0556 Ref	0.6905- 6.1196
Others (Employees, Business, Vendors) (n=15)	06 (40.00)	09 (60.00)					
Socio-economic status**							
Upper middle class (n=11)	6 (54.55)	5 (45.45)	5.0043	3	0.171482	1.2000 Ref	0.2464- 5.8440
Middle class (n=14)	7 (50.00)	7 (50.00)				2.4300	0.6991-8.4461
Lower middle class (n=121)	40 (33.06)	81(66.94)				1.4333	0.4038-5.0873
Lower class (n=79)	36 (45.57)	43 (54.43)					

*p value <0.05 indicates statistical significant.

** As per Modified BG Prasad classification 2019.¹²

Discussion

The present study was aimed at assessing the utilization pattern of complete antenatal care package and also to evaluate the causable factors affecting it.

The overall utilization of complete ANC package as a whole was 39.56% in the present study. This low rate of utilization was attributed to factors like literacy, gravida of the women, occupation, sociocultural factors and

socioeconomic status subject to awareness, availability and accessibility of the services.

In the present study, it was found that 40.44% of the women were in the age group of 18-25 years, which was similar to a study done in Belgaum, Karnataka by Paudel DP et al.,¹³ where 54.6% of the women belonged to 20-24 years of age.

A study done by Jerath et al.,¹⁴ in urban slums of Delhi, 44.4% had registered pregnancy in first trimester, which was similar to the present study where 50.66% women availed ANC in first trimester.

In the present study, 43.56% of the study participants were illiterates and 58.67% belonged to nuclear family, which was alike to the results of a study done in Gujarat by Bhimani RN et al.,¹⁵ where 43.92% were illiterates and 42.93% lived in nuclear families.

In a study done by Jogia PD et al.,¹⁶ Junagadh, Gujarat, 80% of study participants were Hindus majority were homemakers, 56% were primigravida, whereas in the present study 72% were Muslims, 56.89% were homemakers and 61.78% were primigravida.

In a study done by Sarkar TK et al.,² in West Bengal it was observed that 90.26% had availed three or more than three antenatal visits, 55.8% had consumed iron and folic acid tablets for >100 days, 89.6% had taken 2 doses of tetanus toxoid injection, whereas the present study findings revealed that 46.67% had taken 3 antenatal visits, 38.67% had consumed iron and folic acid for a minimum of 100 days and 72% had taken two doses of tetanus toxoid injections.

The present study findings revealed that 39.56% had utilized the complete ANC package, which was significantly associated with literacy, primigravida and homemakers. This was in resemblance to findings of a study done in Gujarat where 46.03% had availed complete ANC package and was significantly associated with literacy, employment status of women and socioeconomic status.

Conclusion

ANC bestows opportunity to communicate with and support women, families and communities at an essential phase of a woman's life. Although the services

are feasible, affordable and accessible but the complete ANC package utilization remains in a dismal state.

The communication and support of ANC are vital not only in saving lives, but enhances health-care utilization and quality of care. Women's positive experiences during ANC lays foundation for healthy motherhood in the community and nation as a whole.

Acknowledgement: We express our sincere gratitude to all the women who participated in the study spending their precious time.

Ethical Clearance: As the study was community based, the women were enrolled in the research after obtaining written informed consent on voluntary basis.

Conflict of Interest: Nil

Sources of support: None

Sources of Funding: None

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Awareness about Diabetes: A Comparison between Population of Urban Areas and Urban Slums.

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Abstract

Background: Developing countries like India are witnessing a huge rise in the cases of diabetes mellitus (DM). Education is one of the key components in its management. By assessing awareness levels, suitable awareness programs can be organised.

Objective: This study aimed to find awareness regarding DM and compare it among those living in urban areas and urban slums.

Methodology: In a cross-sectional study design, a Diabetes Awareness Questionnaire was prepared by the researchers to assess awareness levels. 400 subjects (200 each from urban areas (UA) and urban slums (US)) were selected. The mean of responses was calculated. Chi-square test was used to compare means of two groups.

Results: 41.5% of population of US and 80.5% of population of UA knew that there was reduced insulin production in DM. 37.5% and 80.5% of population knew normal fasting blood glucose level in US and UA respectively. 72.5% and 74% from US and 84% and 80.5% from UA knew that increased urination and increased thirst, respectively, were initial symptoms of DM.

Conclusion: Overall the level of awareness in both US and UA was found to be low. Thus, there is a need for more diabetes awareness programs as it can lead to prevention and better management of the disease.

Keywords: Diabetes, Awareness, Urban slums, Urban areas.

Introduction

Diabetes mellitus (DM) has become a global epidemic. In India, there are 69.1 million people with DM and this is going to increase in the coming years.¹ DM is rampant, especially in the developing nations², and most cases are now falling in the younger age group.^{3,4} Lifestyle habits from urban cities have started to

replicate in semi-urban and rural areas thereby affecting people across different strata of society.⁴

DM is associated with complications that hamper quality of life significantly. With scarce resources to deal with the problem, DM is a huge burden on the healthcare industry.³ Yet awareness about DM is poor among diabetics and non-diabetics.^{4,5}

Various researchers have assessed awareness regarding DM and almost all have used a questionnaire to extract information. Singh et al, 2012 studied rural population of northeast India and found that only 21.4% of them knew of a disease called DM⁶ whereas the CURES-9 study found this to be 75%.⁷ The awareness regarding symptoms, management and other aspects has been found to be low in most studies. Murugesan et

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al, 2007 found low levels of awareness in both diabetic and non-diabetic population. However, diabetics had better knowledge about symptoms and preventive aspects of DM than non-diabetics.⁸ Sabri et al, 2007 studied 240 diabetics in rural and urban areas and found that urban residence, higher education level and higher socioeconomic status were associated with high awareness levels.⁹ Khapre et al, 2011 also found that rural population had poorer knowledge in comparison to urban population. Most people were aware of signs and symptoms of DM but lacked awareness regarding risk factors, management and complications.⁴

Mathew et al, 2012 studied 500 adults in south India and found low awareness on major risk factors for DM.¹⁰ Educational-level and presence of family history of diabetes were the most important factors associated with knowledge of DM.^{9,10} Education is one of the key components in ensuring better treatment and control of DM and evidence has showed that poor knowledge is associated with poor disease management.⁴

Owing to small sample size and heterogeneity of our population, the results cannot be generalised.³ Also, the number of questions asked have been inadequate to get a comprehensive idea about awareness levels. No study has been done in urban slums where a significant population resides. Thus there is a need to find awareness levels in urban areas and urban slums of a city like Delhi which is seeing a huge rise in the prevalence of DM. This study aimed to find awareness levels regarding DM in people living in urban areas and urban slums of Delhi and compare the same in these two groups.

Method

Identification and selection of trials

Table 1: Characteristics of population

	Total population (N=400)	UA (N=200)	US (N=200)
Mean Age (in years)	39.4	41.4	37.4
Diabetic (in %)	41	57.5	24.5
If any family member had DM (in %)	18.5	25	12

The present study was a non-experimental cross-sectional study in which a Diabetes Awareness Questionnaire (in both Hindi and English) having questions related to general information, initial symptoms, risk factors, management options, complications and sources of information of DM was developed. 400 subjects (200 each from urban areas (UA) and urban slums (US)) with age above 18 years and with no reading disability and/or cognitive impairment participated in the study. The subjects of UA were approached through Resident Welfare Associations (RWAs), out-patient department and camps set up in these areas while those of US were approached through Community Based Rehabilitation (CBR) workers working at CBR centers set up by Amar Jyoti Charitable Trust, New Delhi at these places. A sample of convenience was used.

Procedure

Subjects were approached for the study. After receiving their informed consent, they provided basic demographic details and answered questions of the questionnaire. The data was subsequently tabulated for analysis and was analysed using Stata 14 software. Mean was calculated for all the responses. Chi-square test, wherever applicable, was used to compare means of two groups (US and UA). A p-value of less than or equal to 0.05 was considered to be significant.

Results

Of the total population, 41% was diabetic (57.5% from UA and 24.5% from US). The results have been shown in Table 1, 2 and 3.

The table 2 shows the %age of population who said ‘yes’ for the particular parameter (for instance: 61% of the total population believes that there is reduced insulin production in DM).

*- For normal fasting blood sugar level, the depicted %age in the table is the %age of population who chose the correct range of blood sugar level.

#- Statistically significant difference present using chi-square test ($p \leq 0.05$).

Table 2: Knowledge about DM on various parameters (all values in %age)

Parameter	Total Population	UA	US
A. General Information about DM			
Reduced Insulin Production#	61	80.5	41.5
Increased blood sugar	89.75	94	85.5
Normal fasting blood sugar level*	59	80.5	37.5
B. Symptoms			
Frequent urination#	78.25	84	72.5
Increased thirst	77.25	80.5	74
C. Risk Factors			
Overweight#	68	85.5	50.5
Age	45.75	45.5	46
Family history#	37	26	48
Poor dietary habits	60.5	60.5	60.5
Lack of physical activity	49	49	49
D. Complications			
Blurring of Vision#	58	35.5	80.5
Frequent Infections#	24.75	9.5	40
Foot Ulcers#	39	27.5	50.5
Numbness in hand/foot#	46	20	72
Loss of body part#	36	17.5	54.5
E. Management			
May require Insulin	53	53	53
Manage Weight#	41.75	25	58.5
Exercise Regularly	72	72	72
Make Dietary Changes	70	61	79

The table 3 clearly shows that top 3 sources of information for UA were ads on TV/radio, posters and doctors and while those for urban slums were family/friends, doctors and ads on TV/radio. Internet was not a major source in both UA and US.

Table 3: Sources of Information regarding DM (all values in %age)

Source	Total Population	UA	US
Doctor/Health Care Professional	55.25	44	66.5
Family/Friends	53.75	34.5	73
Ads on TV/Radio	56	56	56
Newspaper/Magazine	34	32.5	35.5
Internet	16.75	14	19.5
Posters on roadside/hospital	45	45	45
Health Camps	41.5	32.5	50.5

Discussion

According to our knowledge, this is the first study to have studied awareness regarding DM in Delhi's urban areas and urban slums. We found that people had some basic knowledge about DM and its symptoms and this may be due to advertisements and articles seen more often in media these days. However, awareness regarding risk factors, complications and management options was found to be low. This is in agreement with results of previous researchers viz. Muninarayana et al 2010, Satyawali et al 2016 and others.^{5,11,12}

When compared to urban slums, people of urban areas were somewhat better with respect to general information about DM; were almost similar with respect to symptoms and management options; and were less aware with respect to risk factors and complications. However, a deeper understanding of the disease is missing in both the groups. Deepa et al 2014 studied population of 4 different geographical locations of India and found that awareness was significantly lower in rural areas than in urban areas.¹³

Studies have shown that awareness can improve when education is imparted. In a study done in southern India, short term training on non-communicable diseases (specially DM) was imparted to teachers who in turn educated high school students. An assessment 6 months post training showed significant improvement in health perception and lifestyle changes (viz. avoiding junk food, playing outdoor games) among teachers

and students (Selvam et al 2017).¹⁴ Fezeu et al 2010 also found that awareness was good in areas where education on DM was imparted during last 4 years.¹⁵ In urban slums, where people remain undiagnosed and infrastructure is inadequate, community health workers can play a positive role in educating and strengthening public health interventions.¹⁶ Limaye et al (2017) found that providing virtual assistance in form of mails and messages reduced obesity prevalence at 1 year in IT company employees.¹⁷ So such assistance can also be sought in today's digital world.

As far as sources of knowledge regarding DM are concerned, our results clearly indicate the importance of physician in providing information. Srivastava et al also found doctor to be major source of information to caregivers of diabetic patients as they educate about management and complications.¹⁸ Thus there is a need to make this patient-physician interaction stronger by giving more time to patients, using handouts and written instructions instead of verbal communication. Effective communication leads to adoption of healthy lifestyle and subsequently improved self-care.¹⁹ Media in form of TV/radio shows and newspaper articles can also play a vital role.

Almost all researchers have used questionnaires which can have open-ended or the more feasible close-ended questions. In open-ended questions, response depends upon the recall ability of the interviewee. In closed-ended questions, guess work and response bias

may exist as respondents tend to give more answers in 'yes' in order to seem more aware.^{7,20} Our questionnaire had most questions closed-ended and this could be one reason for greater awareness regarding risk factors and complications in urban slums than in urban areas.

To tackle diabetes and reduce its complications, there is a need to strengthen existing programs. One such program, The National Program for Control of Diabetes, Cardiovascular Disease and Stroke covers the entire country and aims to promote healthy lifestyle; generate awareness; screening and early detection; and provide timely and affordable treatment.²¹ Young students and women could take initiatives and form small chains where they can teach other thus spreading awareness in the entire community.

Conclusion

India is the diabetes capital of the world but is not ready to face the challenges it imposes owing to low awareness levels among its people. Education can be the first step in prevention of diabetes as it would encourage people to adopt healthy lifestyle thereby lowering the burden of disease.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Amar Jyoti Institutional Review Board-EC

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Climatic Variation Water Quality Assessment of Selected Temple Ponds in Kanchipuram

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Abstract

Kanchipuram is the holiest city in Tamil Nadu, India. It has more number of Temple ponds, ponds having water has been selected for the study of climatic variations under physico chemical and biological parameters of water. The period of the study is pre monsoon march 2019 and post monsoon January 2020. The following parameters pH, electrical conductivity, dissolved oxygen, total dissolved solids, chlorides, sulphates, total hardness, calcium, magnesium, ammonical nitrogen, total nitrogen, total phosphate, total silica and biological parameter Total coliform count has been considered in the analysis. The results were linked with ISI-IS: 2296-1982 standards for surface water. The result shown that dissolved oxygen in all seventeen temple ponds has been greater than the standard limit in both the season. The remaining physico chemical, biological parameters were within the limit comparing with class B,C,D,E standard. Analysing the results the temple pond water appropriate in both the climate for bath, swim, fish culture, irrigation, etc. Climatic variation cannot cause the major changes in the pond water.

Key Words: Temples, Pond water, Parameters, Physico chemical, Biological

Introduction

Living mechanism on the earth planet is possible with the presence of water. On the total earth surface 72 percentages have been covered with water. Distribution of water about ninety six percentages as sea water remaining in the form of glaciers, ground water¹. Water quality is the most significant in surface water aquaculture because water quality value disproportions can cause pressure, reduced growth, and mortality of the culture species. The temple tanks are old-fashioned rainwater storage structures built near to the temples in India for use by the public². There are residences around the temples, temple tanks. In olden times, the water in the temple tank was utilized for drinking purpose also, at present used for bathing and washing. These tanks facilitated in recharging the shallow open wells positioned in households in and around the tank. The effect of this system ground water quality is can be established. Now a day temple tank has fallen into disorder. Houses were constructed around the tanks, which polluted, preventing ground water from leaching

in. Pollution is the most important problem as a seventy percentage of shallow water resources and ground water resources have been contaminated by organic, inorganic and biological pollution³. Limnology is the study of the practical connection and productivity of fresh water affected biotic groups by the physical, chemical and biological environmental factors⁴. This present study in pond water was aimed to assess the pollution level and how the climatic variation affects the deterioration of water quality due to pollution.

Method

i. Study Area: Kanchipuram is 75 kms from Chennai, it is one of the seven holy cities in the country. In Kanchipuram, temples are constructed with pond and without a pond. At present due to environmental impacts few temple ponds having water. Preliminary survey shows seventeen temple ponds having water. These ponds selected as sample points. The latitude and longitude values measured with the GPS device. The names and location of the temple ponds (sample points)

as shown in Table 1.

ii. Sample Collection

Pond water samples have been collected by hygienic bottles. The bottles were completely washed while collecting the water samples and properly labeled. The obtained results were compared with as per ISI-IS: 2296-1982 tolerance limits. Based on the tolerance limits the classifications of water given as following Class, A - Drinking water source without conventional treatment, after disinfection, B - Outdoor bathing, C - Drinking

water source with conventional treatment followed by disinfection, D – fish culture, wildlife propagation, E – irrigation, industrial cooling, controlled waste disposal.

Results

To determine the pollution level in the seventeen ponds the water sample was analyzed with the physico chemical and biological parameters. These parameter values of seventeen sample points in pre monsoon are shown in Table 2 and post monsoon are shown in Table 3.

Table 1: Names and location of seventeen temple ponds (sample points)

S.NO	Pond No.	Name of The Temple	Level of Pond Water		Latitude	Longitude
			Pre Monsoon	Post Monsoon		
1	P1	Lakshmi Narayana Temple	Low	Medium	12°48'41.49"N	79°41'16.84"E
2	P2	Kamakshi Amman Temple	Medium	High	12°50'27.21"N	79°42'11.00"E
3	P3	Kailasanathar Temple Sevilimedu	Medium	High	12°50'32.20"N	79°41'23.16"E
4	P4	Kasi Viswanatha Temple	High	High	12°50'45.09"N	79°41'41.92"E
5	P5	Astabhujakoram Temple	Low	Medium	12°49'22.97"N	79°42'38.90"E
6	P6	Puniya Koteeswarar Temple	Low	Medium	12°49'28.67"N	79°42'43.49"E
7	P7	Kusala kottam	Low	Medium	12°49'02.28"N	79°43'22.15"E
8	P8	Kachabeshwarar Temple	Medium	High	12°50'18.43"N	79°42'04.80"E
9	P9	Varadharaja perumal Temple (front side)	Medium	High	12°49'12.36"N	79°43'27.98"E
10	P10	Varadharaja perumal Temple (back side)	Low	Medium	12°49'10.05"N	79°43'36.98"E
11	P11	Sonnavannam Saitha Perumal Temple	Low	Medium	12°49'30.39"N	79°42'44.74"E
12	P12	Dharmalingeswarar Temple	Medium	High	12°49'21.91"N	79°41'57.44"E
13	P13	Ekambareswarar Temple	Medium	High	12°50'49.88"N	79°42'02.16"E
14	P14	Santhaleeswarar Temple	Low	Medium	12°49'06.54"N	79°42'48.52"E
15	P15	Vilakoli Perumal Temple	Low	Medium	12°49'29.64"N	79°42'20.13"E
16	P16	Kailasanathar Temple	High	High	12°48'57.82"N	79°40'58.01"E
17	P17	Thamarai Kulam	High	High	12°49'37.33"N	79°43'02.15"E

Table 2: Physico, chemical and biological parameter values of sample points in pre monsoon

Pond No.	pH	DO (mg/l)	TDS (mg/l)	Cl(mg/l)	SO4 (mg/l)	EC (μ mho/cm)	TH (mg/l)	CA (mg/)	Mg (mg/l)	AN (mg/l)	TN (mg/l)	TP (mg/l)	TS (mg/l)	TCC(MPN))
P1	7.3	6.6	242	54	27	406	136	28	16	5.7	13.2	8.5	7.3	1500
P2	8.9	6.7	424	116	68	710	148	28	19	8.3	16.7	11.3	10.3	400
P3	8.6	6.6	232	66	37	388	115	18	17	6.7	15.2	17.3	26.8	2100
P4	7.5	7	772	212	98	1290	272	48	37	7.2	17.5	13.5	33.6	1100
P5	7.6	6.9	632	176	95	1060	218	38	30	4.9	10.6	9.7	18.3	1400
P6	7.7	7	402	84	62	680	169	33	21	6.5	16.5	10.2	20.9	760
P7	7.8	7.2	420	87	53	712	252	40	37	7.3	21.8	16.8	28.3	860
P8	7.6	7.4	326	68	36	548	191	32	27	5.7	11.8	6.8	13.9	960
P9	7.8	7.3	236	55	36	404	85	16	11	2.7	6.9	4.3	9.7	850
P10	7.9	7.3	512	130	76	860	196	39	24	7.5	16.7	10.8	26.8	2100
P11	8.2	7.5	952	286	145	1610	285	55	36	5.9	11.8	7.6	32.8	1500
P12	8.04	7.6	1380	486	369	2320	342	68	42	9.2	22.3	11.8	36.4	1850
P13	7.6	6.9	212	52	36	360	81	16	10	3.6	7.9	3.5	6.8	600
P14	7.7	7.2	864	238	125	1450	328	72	36	5.8	16.3	12.4	27.6	1700
P15	7.9	7.1	752	236	115	1260	203	40	25	4.8	12.5	7.6	18.7	1200
P16	8	6.9	520	143	87	870	155	29	20	6.8	9.5	8.6	17.3	850
P17	7.6	6.9	546	144	72	920	246	46	32	6.8	13.7	10.5	27.9	960

Table 3: Physico chemical and biological parameter values of sample points in post monsoon

Pond No.	pH	DO (mg/l)	TDS (mg/l)	Cl(mg/l)	SO4 (mg/l)	EC (μ mho/cm)	TH (mg/l)	CA (mg/)	Mg (mg/l)	AN (mg/l)	TN (mg/l)	TP (mg/l)	TS (mg/l)	TCC (MPN))
P1	7.6	6.9	242	68	33	4.3	158	32	19	6.5	14.6	6.8	9.2	2100
P2	8.3	6.7	470	136	74	812	184	36	23	9.6	14.3	7.3	11.5	450
P3	8.4	6.6	286	76	42	486	112	22	14	3.4	8.6	10.2	19.6	2800
P4	7.9	6.7	842	254	106	1403	337	56	48	8.3	14.8	10.8	24.6	1900
P5	7.3	6.5	710	205	107	1236	258	44	36	3.8	9.7	5.6	14.8	1700
P6	7.2	6.7	465	119	86	792	200	39	25	7.6	11.8	9.6	17.5	890
P7	8.2	6.7	542	136	69	912	294	52	40	8.6	16.8	10.4	22.5	950
P8	8	6.9	346	86	44	584	220	39	30	6.3	7.5	6.9	10.5	840
P9	7.3	6.8	256	67	42	432	110	21	14	1.9	5.3	3.8	7.6	1100
P10	8.3	7	612	154	94	1040	246	46	32	6.5	12.8	9.6	18.6	2600
P11	8.7	7.2	1090	326	168	1836	359	68	46	3.8	9.5	8.3	26.8	2000
P12	7.9	6.7	1782	526	342	3012	428	84	53	10.6	26.5	14.3	32.7	2450
P13	7.4	6.6	262	63	38	440	97	19	12	2.3	6.7	4.7	8.4	750
P14	7.9	7.1	942	257	149	1584	394	87	43	6.8	11.7	10.6	22.6	1860
P15	7.7	6.7	912	268	136	1542	230	46	28	5.3	9.2	11.3	15.9	1640
P16	7.8	6.5	572	168	93	968	189	36	24	5.3	8.6	5.9	11.5	1100
P17	7.6	7	486	174	93	828	315	57	42	7.3	11.5	9.4	22.5	1230

Table 4: Standard Tolerance limit for class A,B,C,D,E

Sl.No	Parameters	Standard value				
		A	B	C	D	E
1.	pH	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	6.0 to 8.5
2.	DO (mg/l)	6	5	4	4	----
3.	TDS (mg/l)	500	----	1500	----	2100
4.	Cl (mg/l)	250	----	600	----	600
5.	SO4 (mg/l)	400	----	400	----	1000
6.	Ammonical Nitrogen (mg/l)	----	----	----	----	----
7.	Total Nitrogen (mg/l)	----	----	----	----	----
8.	TCC	----	500	5000	----	----
9.	Electrical conductivity μ mho/cm	----	----	----	----	2250

Illustrations (Figures)

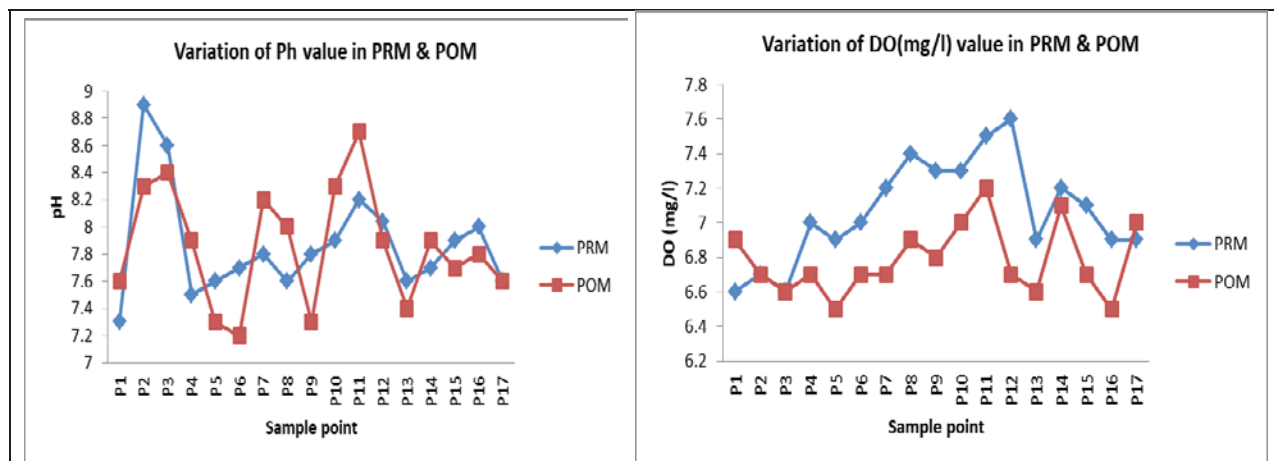


Figure 1: Variation of pH value, DO value in Pre monsoon & Post monsoon

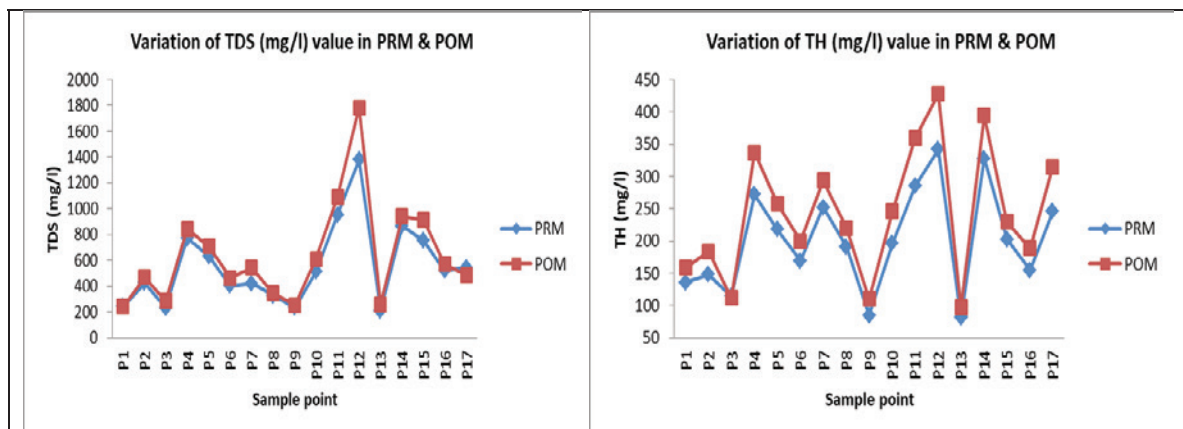


Figure 2: Variation of TDS value, TH value in Pre monsoon & Post monsoon

Discussion

i. pH

pH is an important environmental factor. It is the scale of acidity and alkalinity of any water. It is the effect of exchanges of various ingredients in the solution⁵. In the present study pH noted in the sample point ranges from 7.3 to 8.9 in pre monsoon and 7.6 to 8.3 in post monsoon. This higher pH value due to rise in temperature by the improved rate of photosynthesis causing in the greater consumption of carbon dioxide. Variation of pH values in pre monsoon and post monsoon are shown in Figure 1. Climatic variation shows minor changes.

iii. Dissolved Oxygen

Dissolved oxygen is important for growth of each fauna. In precipitation and dissolution of biological materials dissolved oxygen plays a major part⁶. In the present study dissolved oxygen, noted in the sample point ranges from 6.6 mg/l to 7.6mg/l in pre monsoon and 7.2mg/l to 8.7mg/l in post monsoon. The greater values of dissolved oxygen because of lower water temperature and great photosynthetic activities. Variation of dissolved oxygen values in pre monsoon and post monsoon shown in Figure 1. Climatic variation shows minor changes.

iv. Total Dissolved Solids

Total dissolved salts composed of some inorganic salts Calcium, Magnesium, Potassium, etc. It composed of some organic material in minor quantity⁷. In the present study, the total dissolved solid values are lies between 232 -1380 mg/l in pre monsoon and 242 -1090 mg/l in post monsoon. It is the important criterion for water quality determination. Climatic variation of TDS values in pre monsoon and post monsoon are shown in Figure 2. Climatic variation shows minor deviation, decreased value of TDS in the post monsoon comparing to pre monsoon is solids diluted in rain water.

v. Chlorides

Chlorides are the anions were present in all natural waters in different concentrations. The source of chlorides in surface water is leaching of sedimentary rocks, discharge of domestic and industrial wastes, etc. In the present study, the chloride values lie between

54-486 mg/l in pre monsoon and 67-526 mg/l in post monsoon. Chloride enters water by the solvent action of water on salts present in the soil⁷. Climatic variation shows minor deviation. Considering class A the value greater, other classes it satisfies the limit.

vi. Sulphate

The sulphate mixed with surface water from top hills, flow through rocks and mixed in water bodies during precipitation, low concentration from decomposition of organic matter⁷. In the present study, the sulphate values vary from 27–369mg/l in pre monsoon and 33-342 mg/l in post monsoon. Considering class A – E standard the sulphate value satisfies the limit.

vii. Electrical Conductivity

Electrical conductivity is the one way to assess the clarity of water. The ionic power as conductivity is a measure of total ions⁸. The ionic power of a sample water depends on the ionization of solutes and other ingredients melted in it. In the present study, the Electrical conductivity varies from 388 – 2230 μ hos/cm in pre monsoon and 430 – 3012 μ hos/cm in post monsoon. Climatic variation shows the minor deviation in the values.

viii. Total Hardness

Hardness is the calcium and magnesium salts combines with bicarbonates, and carbonates, it gives the temporary hardness and with sulfates, chlorides and others anions of a mineral acids producing permanent hardness⁸. In the present study, the total hardness varies from 81-328 mg/l in pre monsoon and 97-428 mg/l in post monsoon. Variation of total hardness values in pre monsoon and post monsoon are shown in Figure 2. Climatic variation shows the minor deviation in the values.

ix. Calcium

Calcium is a significant mineral in natural water⁸. Calcium plays an essential role in the biological productivity of the lakes and ponds. In the present study, the calcium varies from 16-72 mg/l in pre monsoon and 19-87 mg/l in post monsoon. Considering class A – E standard the calcium value satisfies the limit. The water is suitable for domestic use.

x. Magnesium

Magnesium is one of the main ingredients in natural waters and is a energetic component of chlorophyll⁸. In the present study, the magnesium varies from 11-42 mg/l in pre monsoon and 12-48 mg/l in post monsoon. The water is suitable for domestic use.

xi. Ammonical Nitrogen and Total Nitrogen

Every organism requires nitrogen in the elementary process of life to synthesize protein necessary for progression and reproduction⁹. Ammonia melts in water to formulate ammonium hydroxide and hydroxyl ions these ammonium ions are engaged by aquatic autotrophs with preference over nitrates, thus avoiding it to reach to toxic levels¹⁰. In the present study, the ammonical nitrogen varies from 2.7- 9.2 mg/l in pre monsoon and 1.9 – 10.6 mg/l in post monsoon. In the present study, the total nitrogen varies from 7.9 – 21.8 mg/l in pre monsoon and 6.7 – 26.5 mg/l in post monsoon.

xii. Total Phosphate

Phosphorus is the limiting nutrient in the primary production of fresh waters. Phosphate is a significant nutrient for the maintenance of the fertility of water group. In the present study, the total phosphate varies from 3.5 – 17.3 mg/l in pre monsoon and 3.8 – 14.3 in post monsoon. The greater values of phosphate can be due to speedy evaporation and mineralization of decomposed constituents in pond water.

xiii. Total Silica

Silica is also called as silicon dioxide, it is the compound of the two most plentiful elements in the earth crust, silicon and oxygen, SiO₂. The silica presence in natural water is 5 to 25 mg/l, in some areas 100mg/l is also present. Silica is greatly important in helping to stop osteoporosis and in helping increase bone strength. In the present study, the total silica varies from 6.8 – 36.4 mg/l in pre monsoon and 7.6 – 32.7mg/l in post monsoon.

xiv. Total Coliform Count

The coliform bacteria are nonpathogenic bacteria that arise in the feces of warm-blooded animals. A coliform bacteria increase creates waterborne disease. A positive total coliform is an indication of pollution

in water. In the present study, the total coliform count varies from 400 – 2100 MPN in pre monsoon and 450 – 2600 MPN in post monsoon.

Conclusion

In the climatic variation investigation study concluded that some of the physico-chemical parameters pH, EC, TDS, chlorides, sulphates, total hardness, calcium, magnesium, ammonical nitrogen, total nitrogen, total phosphate, total silica were found within the permissible limits. Dissolved oxygen parameter beyond the permissible limit. The greatest value of the DO is useful for fish growth. The pond water contains biological parameter Total coliform count; it is greater in some pond water. The results indicating organic pollution. Climatic variation cannot cause the major changes in the pond water. The temple pond water appropriate in both the climate for bath, swim, fish culture, irrigation, etc. To tolerate the ecosystem and aquatic life in the pond water there should have awareness programs related to protection of the pond so that aquatic life saved in future.

Ethical Clearance: This study was approved by our university.

Source of Funding: Self

Conflict of Interest: Nil

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Living with Urostomy: Patient's Perspective

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Abstract

The diagnosis of bladder cancer and necessity of urostomy is profoundly life changing. This qualitative study was conducted in order to assess lived experiences of patients who had received urostomy due to bladder cancer or any other urinary pathology. The sample included 30 patients with urostomy admitted in the Urology ward, AIIMS, New Delhi. Purposive sampling was used and data was collected using semi structured interviews. Narrative data was analysed using Colaizzi's steps of analysis for qualitative data. Ten themes emerged from the analyses which were further categorized into sub themes. The theoretical framework of the themes and subthemes defined the phenomenon of living with urostomy in entirety.

Key words: *Qualitative research, Lived Experience, Bladder cancer, Urostomy, Colaizzi's Steps of Qualitative Analysis*

Introduction

Urostomy is a procedure that reroutes the flow of the urine out of the body.¹ Urostomy surgery may be required for many reasons, the most frequent indication being bladder cancer, which is the second most common urologic malignancy.² Of all bladder cancers, 10-20 percent is the muscle invasive type which is classically treated with cystectomy and urostomy.³

Creation of a urostomy significantly alters elimination pattern and can have both physical and psychological effects. The most common physical complications with urostomy are infectious, gastrointestinal, wound related and genitourinary. The physiologic complications involve changes of the stoma and peri-stomal skin including dermatitis, pain, bleeding, necrosis, prolapse, stenosis, herniation, infection and retraction of the stoma.^{4,5}

Many urostomy patients have emotional, social and sexual problems. Urostomy patients are concerned about the effect of the stoma on their ability to carry

out activities of daily living. Ostomy surgery is a life-enhancing procedure that restores a vital bodily function, but it's not easy to accept.⁶

Nurses involved in the care of patients with a stoma should have an understanding of the reasons for stoma creation, and the types of stoma and appliances available. Issues related to diet, sexual relationships and self-image should also be discussed with patients.^{7,8}

There have been significant advances in stoma appliances and an increase in nurses specialising in stoma care. Despite this, a large proportion reportedly up to 75% of patients continue to experience adjustment problems, which suggest that improvements in stoma management are by themselves not enough to enhance functioning.⁷ This inspired the examination of problems of urostomy patients in this study.

Objective: To explore the lived experiences of the patients living with urostomy.

Materials and Method

Research Design and Sampling

A phenomenological qualitative research design was used. Sample size was limited to 30 when data saturation occurred. Purposive sampling was used to select patients who had undergone radical cystectomy and ileal conduit

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surgery. Patients after 5 days of the surgery, above 18 years of age and willing to participate in the study were enrolled.

Research Tools

1. Demographic Profile Sheet:-

The demographic profile sheet was used to collect socio-demographic data of patients. Content validity was obtained from the experts.

2. Semi-Structured Interview Guide:-

An interview schedule was developed which listed the open ended questions to explore the experiences of the urostomy patients. It was validated by experts.

Data Collection

The study was conducted from January 2018 to July 2018. The willing participants were explained about the study and informed consent was signed. Anonymity, confidentiality and privacy of patients were maintained. Face to face interview was conducted by the researcher with a fairly open framework. An interview session lasted 10-30 minutes and was audio taped with the consent of the patient. Field notes were maintained. The place for interview was a private room in the urology ward. Active attention was given to the body language, posture, facial expressions and voice intonation of the participants. Short pauses and silences were dealt with patience as they helped the patient to understand their feelings and put them into words. Emotional support was extended when patient got distraught and cried during the interview.

Data Analysis

The demographic data was analysed using descriptive statistics in SPSS. Statistical tests used to describe the data were frequency distribution, mean and standard deviation.

Qualitative analysis was done simultaneously with data collection. Recorded interviews were transcribed verbatim and translated into English by the researcher and rechecked by translator. Colaizzi's steps of qualitative analysis were used for analysis. The data was read and re-read numerous times to identify the significant responses. A total of 623 significant responses

were extracted from the interviews. Meanings were formulated for these significant responses. In total 808 meanings were identified and grouped under 10 themes as some of the responses were not exclusive but were interrelated and overlapping. Formulated meanings were coded in a MS Excel sheet to extract common themes which were further categorized into sub- themes. The derived theoretical framework integrated participants description to achieve comprehension of the experience of living with urostomy.

Results

Demographic description of sample

The sample composed of primarily male participants 90% (n=27) with average age of 57±11.61 years. Urinary bladder cancer was the primary disease in 28 patients, with only two female patients having urinary bladder metastasis. Majority of the patients had radical cystectomy and ileal conduit with or without nephroureterectomy, prostactectomy and lymph node dissection. The mean weight of the participants was 62±9.97 kgs and mean height was 173.2±9.6cms. Most of the patients were not employed 53.3% (n=16). A large proportion of the patients 36.6% (n=11) belonged to lower income group. A striking number of patients 60% (n=18) have smoked or chewed tobacco before diagnosis.

Qualitative Analysis

Ten themes emerged from the lived experiences of the urostomy patients which were further divided into sub themes. [Number] in brackets is the number of significant responses for the particular theme and sub theme. *Italicised sentences* are the expressions of the participants. Following themes were identified.

1. Knowledge regarding urostomy

Most of the patients confirmed lack of knowledge regarding urostomy [36].

...*"I don't know how to wear or change bag and also how to manage if a leakage occurs."* Patient 6

Due to lack of knowledge, patients experienced dependence on the health care staff for changing urostomy bag [14]. Some patients expressed readiness to learn urostomy care [19].

...*"I want to know about the diet, how to change the urostomy bag and what is the frequency of bag changes and also can I lay in prone position?"* Patient 20

2. Physical problems

Patients experienced numerous physical problems related to their disease, treatment and urostomy. Weakness [20] and fatigue [25] was present in most of the patients

...*"I feel very much physically weak. I face difficulty in daily activities."* Patient 1

Skin problems around urostomy were fairly common [9]. Most of the patients had pain and oozing at surgical site [15] thus increasing the risk of infection. [4] Urine leakage from the urostomy was a difficulty faced by almost all the patients [23]. Continuous lying down in bed also caused discomfort [5].

...*"Because of constant lying down on the bed, I have developed bed sores on my back."* Patient 13

Patients had difficulty in maintaining hygiene due to surgical incision and urostomy [6]. Surgical creation of ileal conduit requires resection of ileal segment causing digestive problems in the patient postoperatively like abdominal bloating [18], stomach ache [15], nausea, vomiting [1], and loss of appetite [23], constipation [4] and diarrhoea [1].

...*"I was distressed by stomach ache and gas for which they gave medicine and now it's better."* Patient 25

3. Psychological Problems

Mental tension [15] and depression [17] were evident followed by feelings of hopelessness [4], helplessness [24] and dependency [12].

...*"It feels as if half of my life has slipped out of my hands."* Patient 1

...*"Yes, mental tension is there. It is better to die than to suffer from this."* Patient 3

Most of the patients were middle aged males and sole earner for the family. They were highly stressed due to the failure to meet family role [22].

...*"We are helpless for my son's education. Even if I*

sell my land, then where will we go? I dreamt of making him a doctor (Pause)." Patient 23

Patients had fear of urine leakage from urostomy [7] and were anxious [6] and embarrassed because of the urostomy [16].

...*"I feel sometimes, that why has this happened in front of my children. Now, they will have to even tie my pyjama. I feel ashamed because of that."* Patient 20

Some patients also expressed anger [11].

...*"Everyone has to die one day, but it should not be so early in my case."* Patient 27

Feelings ranged from disbelief, confusion and ambivalence towards urostomy [14]. Some patients vehemently denied mental stress [12] to avoid stressful disclosure with the researcher, while some were unwilling to communicate on certain questions [3]. Conversely, some patients talked optimistically about urostomy and were hopeful of the future [43]. Positivity was also noted by in terms of readiness to change to a healthy lifestyle [16].

...*"This operation saved my life otherwise I would have died. So, whatever has happened is for good."* Patient 28

...*"Isn't there is something which can be fitted inside the body. It would be better, if it is not visible outside."* Patient 22

4. Impact on daily activities

Patients reported difficulty in performing their daily activities [9]. Sleeping was disturbed in some of the patients [5].

...*"Yes, the sleep is stressful, I worry that it may leak and spoil the bed."* Patient 27

Doubts related to diet were common [16]. Travelling was deeply impacted because of urostomy [21]. Patients were concerned about bag leakage [10] and practical difficulties in driving [8]. Dressing was also a matter of concern for most of the patients like ability to wear undergarments and their regular clothes [23].

...*"If I wear pants below the stoma, it is not very comfortable, so, I try to wear it above the stoma. The*

pants have to be stitched according to the stoma.” Patient 27
can I do?” Patient 2

5. Social Problems

Many of the patients restricted their social activities. They were concerned about extra preparations needed for urostomy [26].

...*“If there is a function somewhere, I won’t be able to attend as I will have to keep supplies with me.”* Patient 23

Most of the patients felt social stigmatization because of the urostomy and recognized the lack of social support system [22].

...*“People will wonder that what disgusting problem I am suffering from. My neck will be hung in shame.”* Patient 11

6. Family Problems

Family functioning was greatly disturbed. Most of the patients perceived anxiety and stress in the family members [7] and were aware of the caregiver’s burden on their attendants [5].

...*“Everybody has been caring for me from last 1 year. There has been lot of tension in the family.”* Patient 10

Most of the patient were male and were experiencing sexual difficulties but they were not comfortable enough to discuss it with the researcher except few [5].

...*“I have very much problems. I can’t talk about sex right now. Please ask about it later.”* Patient 23

...*“I am not able to maintain sexual relations with my wife (nonverbally messages not to talk about sexual problems),”* Patient 26

7. Occupational Problems

Patients were anxious about their inability to do heavy work [21] and were uncertain of whether occupation can be continued. Financial consequences of incapability to work were a cause of turmoil.

...*“I am sitting idle for about 3 years now. My work is done partly by my children, so I am able to live. What*

8. Financial Problems

Majority of the patients with few exceptions had strained finances [14] and was worried about additional expense of urostomy [23].

...*“The main problem is monetary expenses. The supplies are very costly.”* Patient 26

Few patients were unable to procure supplies for urostomy and struggling for daily needs [5].

...*“Sometimes, the bag bursts. If by chance we don’t have money to buy bag that day, then my clothes are drenched in urine whole day.”* Patient 3

9. Religious and Spiritual Problems

Some patients quoted the need to change to spiritual lifestyle considering they have got a second chance at life because of urostomy [5]. In contrast, urostomy was considered causing impurity of body because of bodily contact with urine by some [14]. Patients were emotionally stressed because they couldn’t offer prayers [2].

...*“In our religion, even if a drop of urine touches the body then prayers are not offered. We have to be totally pure to pray. (Eyes well up with tears).”* Patient 16

10. Health Care Issues

The patients from remote areas were stressed because of the inaccessibility of health care near their home [7]. Some patients experienced distress due to delayed care because of limited health care staff and resources [6].

...*“Staff is very less here.”* Patient 23

Most of the patients had faith in capability of health care team [3].

...*“They have done really good for me. Whatever happened with me has been good so far.”* Patient 24

The detailed description of the themes and sub themes facilitate vision of the overall experience of living with urostomy. Researcher observed that the

experiences of different patients were as varied as their personalities, demographics and social circumstances, but were unified by their common struggle of living with urostomy.

Discussion

In the last 30 years, much has been done to improve the quality of life for patients with stoma. In spite of these, however, even today it is a very difficult to live with urostomy. Literature describes the numerous problems of urostomy patients. The present study also confirmed these issues.

The findings of the present study are consistent with other researchers who have discussed physical problems of urostomy patients.⁸ In the present study some of the physical problems were problems due to location of urostomy. Skin problems and urine leakage was a major issue. Patients also described lots of digestive problems.

Around one-quarter of stoma patients experience clinically significant psychological symptoms postoperatively.⁹ In this study, mental tension and depressive feelings were present in most of the patients. Patients had fear of urine leakage and were embarrassed of the urostomy and declared it as retribution for their bad conduct. Socially, urostomy patients found themselves vulnerable to other's reaction to the urostomy, thus restricting their social activities.¹⁰ In general, family and friends can be an immense source of support which was also narrated by most of the patients in the study.¹¹ Ostomy surgery may affect the patients' sexual relationship with their intimate partner which was also the case in present study.¹²

Most of the participants belonged to lower economic group with few exceptions. It was difficult for them to bear the burden of disease and urostomy. Another important finding relates to religious issues. As with many religions, it is important to be clean, especially when praying. This was regarded as the worst effect of the urostomy by some patients. Study participants expressed faith in the health care professionals although they were aware of the shortage of the health care staff and resources.

In this qualitative study, researcher was able to establish a trusting relationship with most of the patients.

Interview offered the patients an opportunity to express their thoughts, feelings and beliefs without being judged. Patients acknowledged the interview to be therapeutic. The findings of this study cannot be extrapolated to wider populations because qualitative research results cannot be tested for statistical significance.¹³ However, the findings are useful for health care providers when creating a supportive environment to improve quality of life of urostomy patients.

Conclusion

Living with a urostomy takes significant adjustment in daily living. A detailed knowledge can facilitate health care personnel to understand the problems of these particular patients and design the health care accordingly. Motivation of the patient to take independent care of their urostomy will lead to better self care efficacy and psychosocial adjustment.

Ethical Clearance- Taken from Ethics Committee, AIIMS, New Delhi.

Source of Funding- Self

Conflict of Interest - Nil

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A Comparative Study of Abdominal Versus Non – Descent Vaginal Hysterectomy in a Tertiary Care Centre

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Abstract

Objectives: Hysterectomy means surgical removal of uterus. Both abdominal and non-decent vaginal hysterectomies are quite popular and acceptable methods among the gynecologist.

To evaluate the appropriate route of hysterectomy (abdominal or vaginal) in our hospital population for benign disease by comparing peri-operative and post-operative complications.

Materials and Method: As per the inclusion and exclusion criteria, 100 cases admitted to the gynaecology unit hysterectomy for benign diseases were randomly selected, out of which 50 cases underwent NDVH (non- descent hysterectomy) and 50 cases underwent AH (abdominal hysterectomy). The parameters evaluated were operating time, I loss, postoperative pain and other postoperative complications.

Results: The results were indicative towards vaginal hysterectomy being a better surgical modality with lesser operating I blood loss, postoperative pain and other postoperative complications.

Conclusion: With adequate vaginal access, good uterine mobility and technical skill, vaginal hysterectomy can performed on a non-prolapsed uterus, with an additional advantage of shorter duration of surgery, intraoperative com| postoperative morbidity and shorter hospital stay. Hence, stating it to be a better surgical alternative to at hysterectomy.

Keywords: Postoperative pain; Abdominal Hysterectomy; Non-Descent Vaginal Hysterectomy

Introduction

Hysterectomies are the most common elective surgeries in gynaecology; and can be performed by abdominal, vaginal or laparoscopic method. Vaginal hysterectomy has distinct health and economic benefits. Both abdominal and vaginal hysterectomies hold their own positions in the gynaecological field.¹

Charles Clay in Manchester performed the first abdominal hysterectomy in 1843. Vaginal hysterectomy

was performed first by Soranus of Ephesus in 120 AD.²

Criteria such as the uterine size, mobility, accessibility and the pathology confined to the uterus (no adnexal pathology or known or suspected adhesions) are mostly the incorporating factors for vaginal hysterectomy.³

Extrauterine disease such as adnexal pathology, severe endometriosis or adhesions may preclude vaginal hysterectomy. Following abdominal hysterectomy patients are might be at higher risk of depression, anxiety.⁴ This study was performed to evaluate appropriate route of hysterectomy (abdominal for our women with benign disease and comparing perioperative and postoperative complications with vaginal hysterectomy).

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Materials and Method

The study was undertaken over a period of 12 months May 2017-April 2018 at CSS, Kolkata. The study was approved by Institutional Ethical Committee. Written informed consent was taken from the participating patients. Total number of 130 cases requiring hysterectomy for diseases were randomly selected out of which 65 underwent NDVH and 65 cases underwent AH. Patients selected as per the following inclusion and exclusion criteria.

Inclusion criteria

- 1) Fibroid Uterus
- 2) Abnormal uterine bleeding (AUB)
- 3) Chronic cervicitis
- 4) Adenomyosis
- 5) Postmenopausal Bleeding

Exclusion criteria

- 1) Uterine size more than 12 weeks of gravid uterus
- 2) Restricted uterine mobility
- 3) Prolapsed uterus
- 4) Patients with complex adnexal mass
- 5) Patients with previous 2 or more LSCS

After taking a thorough history and clinical examination, patients were subjected to routine investigations. Operating time for NDVH was calculated from incision at cervico-vaginal junction to the completion of closure of vault. Operating time for AH was calculated from incision on the abdomen to closure of skin incision.

Blood loss was estimated by preoperative and postoperative (day 2) haemoglobin and hematocrit measurement. Intraoperative complications such as injury to bowel/bladder or ureter and haemorrhage were noted.

Postoperatively all patients were given same antibiotic prophylaxis with adequate analgesia and fluid replacement. Complications like wound infection, vault

hematoma, febrile morbidity, hemorrhage were kept into consideration. Hospital stay was calculated as number of days in hospital after the surgery including the day of surgery.

Postoperative pain was documented as per the visual analogue scale. VAS (Visual Analog Scale) was assessed by asking participants to rate the severity of pain on a 10 cm scale ranging from 'no pain' to 'worst pain'.

Data analysis was done using the SPSS (Statistical Package for the Social Science) Version 17 for window. The t test was used to find significant difference of age, parity, comorbidity, duration of operation, blood loss. MW (Mann Whitney) test was used to find the Significant difference of pain score between AH and NDVH. A probability value of 0.05 was accepted as the level of statistical significance.

Results

The mean age of women in our study was 48.74 years in NDVH, which was higher when compared to AH with a mean age of 46.12 years. ($P < 0.05$)

In maximum number of patients who underwent the surgeries, the underlying pathologies were consistent with first being AUB followed closely by fibroids.

The mean duration of surgery in both the groups were calculated and AH was much lengthier operation than NDVH (AH 72.30 minutes vs NDVH 42.16 minutes, $p < 0.001$). This was a statistically significant finding in this study.

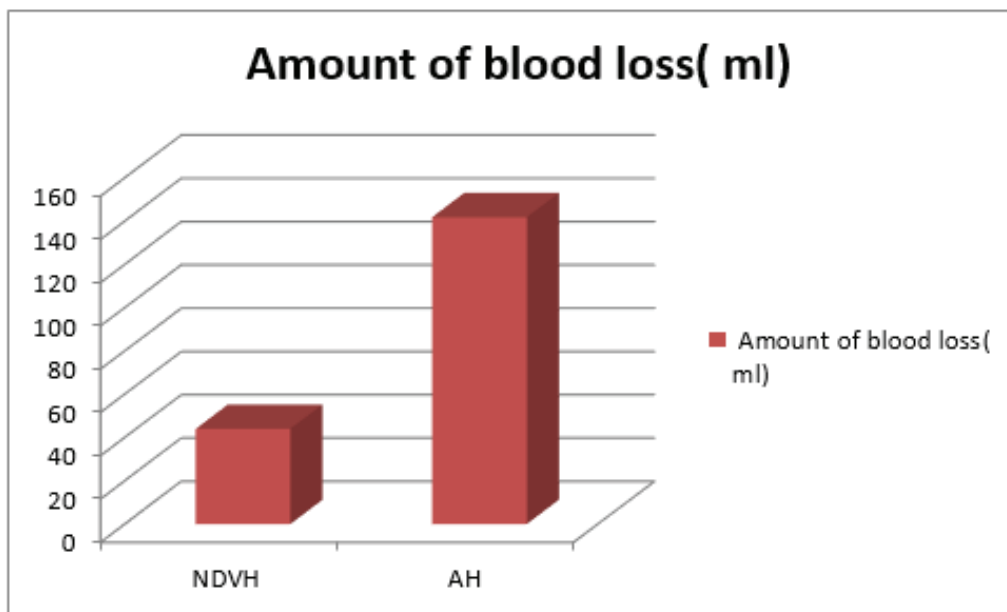
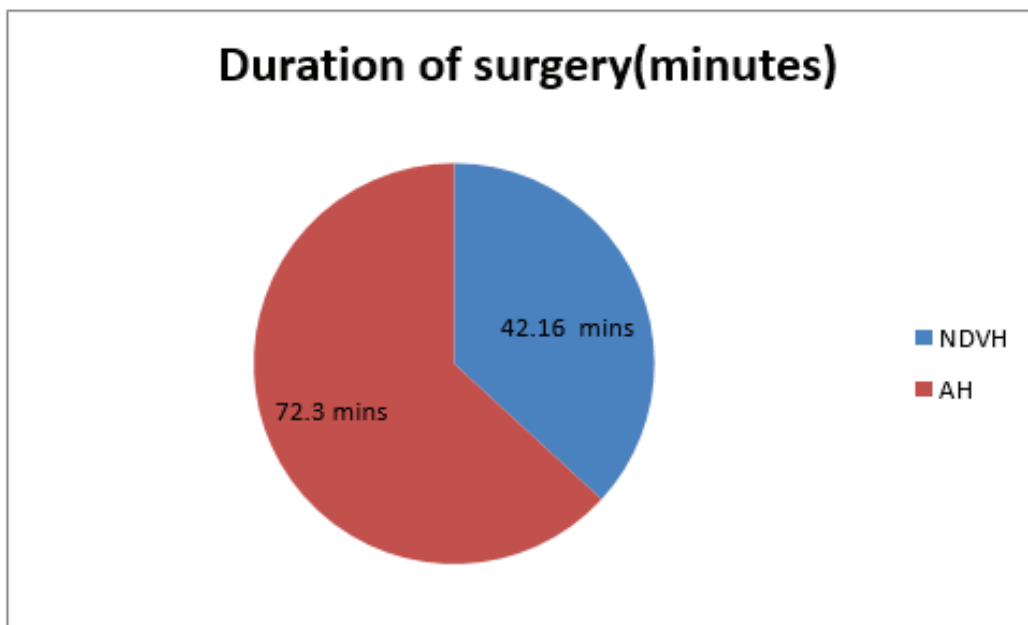
Intraoperative blood loss was higher in the AH group where it amounted to 141.80 ml viz a viz NDVH where the average loss of blood was 43.96 ml. This was statistically significant ($p < 0.05$).

In the 130 surgeries performed the complications were as follows: one case had ureteric injury in AH group, one case had bladder injury in NDVH group and one case had bowel injury in AH group and these were not statistically significant.

Postoperatively pain was measured using the visual analogue scale on day 1, 2 and 3 in which the scores for the patients who underwent AH were always higher than that of NDVH and the difference was statistically

significant($p < 0.001$).

Postoperative complications like febrile morbidity, wound infection, burst abdomen, wound gaping and paralytic ileus were more following AH compared to NDVH but the difference was not statistically significant.



Discussion

The prospective cohort study was carried out to study the indication for abdominal and vaginal hysterectomy for non-descent uterus and to compare postoperative complications in vaginal and abdominal routes of hysterectomy. Advantage and disadvantage for

abdominal and vaginal hysterectomy for non-descent uterus were also studied.

Mean age was more among the cases that underwent NDVH compared to AH in the study group. Mean age in NDVH was 48.74 years and in AH was 46.12 years.

Similar finding was also observed in a study by Asnafiet al.⁵ The mean age of patients who had undergone vaginal hysterectomy was 58.5 ± 12 years and 44.69 ± 7.9 years for abdominal hysterectomy.⁵

In this study AUB, fibroid, PID (Pelvic inflammatory disease) and adenomyosis were common indications for hysterectomy. Abdominal hysterectomy was preferred for fibroid and endometrial hyperplasia, and Non-descent vaginal hysterectomy was preferred for PID and AUB. Similar finding was observed in a study conducted by S Bharatnur (2010) where they studied the comparative risks of complications of abdominal and vaginal hysterectomies and concluded that DUB, Fibroid and chronic cervicitis were common indications for hysterectomy. Other indications were adenomyosis and cervical polyp.⁶

The mean duration of surgery was significantly less among NDVH as compared to AH cases in the study group. Mean duration was 42.16 min in NDVH and 72.30 min in AH. Similar finding were observed in a study conducted by Chen et al where the operation time in VH (mean time 65.2 min) group was significantly shorter than in the abdominal hysterectomy (mean time 95.6 min) group.⁷ S Bharatnur also noted that mean operating time was more in abdominal hysterectomy than in vaginal hysterectomy (AH 101 ± 27.1 min, VH 65 ± 26.2).⁶

Mean blood loss was significantly less amongst NDVH cases as compared to AH. Mean blood loss was 43.96 ml in NDVH and 141.80 ml in AH. Chen et al compared outcomes of vaginal and abdominal hysterectomy in women also concurred with their results showing intraoperative blood loss to be significantly less in the vaginal hysterectomy (mean 30.4 ml) group compared with the abdominal hysterectomy (mean 70.3 ml) group, complication showed that one ureteric injury and one bowel injury was present in AH case, while one bladder injury was seen in NDVH.

N. Fatima et al found that bladder injury occurred in one case in VH (1.9%) and in four cases in AH (2.3%). Ureter injury occurred in one (0.6%) case in AH group. Authors concluded that vaginal hysterectomy is associated with quicker recovery, early mobilization, and shorter hospitalization, less operative and postoperative morbidity when compared to abdominal hysterectomy.⁷

Mean hospital stay in days was significantly less among NDVH as compared to AH. Mean hospital stay was 3 days in NDVH and 4.14 days in AH. Similar finding observed in a study conducted by Chen et al with hospital stay length in the vaginal hysterectomy (mean hospital stay 4.5 days) group being significantly shorter than in the abdominal hysterectomy (mean hospital stay 6.3 days) group.⁸

Even in cases of cervical cancer, different studies have found out that vaginal hysterectomy is better than abdominal procedure, In a study by Zang S et al; LARVH is a suitable alternative to ARH for early-stage cervical cancer, which shows less blood loss, shorter catheterized and hospital stay, and similar survival outcomes.⁹ In a study by Dawood et al, they concluded that patients who required a hysterectomy for benign lesions having a moderate-sized uterus can be offered vaginal route for surgery rather than abdominal due to better peri and postoperative care of the patients.¹⁰

Conclusion

The present study was undertaken to provide objective evidence to assist gynaecological surgeons in their selection of the most appropriate method of hysterectomy and to provide data to permit patients to make an informed decision about their preferred type of hysterectomy. With adequate vaginal access, good uterine mobility and technical skill, vaginal hysterectomy can safely be performed on a non-prolapsed uterus, with an additional advantage of shorter duration of surgery, lesser intraoperative complications, lesser post-operative morbidity and shorter hospital stay. Hence, it can be concluded that NDVH supercedes over AH with patient's favourable outcome and must be the choice of operative procedure amongst the two surgeries.

Conflict of Interest : The author declare that they have no conflict of interest.

Source of Funding : The entire research work was funded by me and my coauthor.

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A Review on Machine Learning Techniques in the Diagnosis of Psychiatric Disorders

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Abstract

Diagnosis of psychiatric disorder is intricate clinical entity that could pose challenges for clinicians involving both accurate identification and effective timely diagnosis. These battles have prompted the evolution of multiple machine learning approaches to help improve the management of the disorder. These methods use clinical, anatomical and physiological information and symptoms obtained from neuroimaging and from clinical investigation to make diagnosis system that may identify psychiatric patients as compared to non-psychiatric patients and predict diagnosis results. This review paper introduces a background on psychiatric disorder, imaging and machine learning methods. This review paper also discussed about the methodologies of previous studies which have implemented imaging and machine learning in the diagnosis of psychiatric disorder and give directions for future use of machine learning techniques in psychiatric-related studies.

Key Words: Machine Learning, Psychiatric Disorder, Neuroimaging, Magnetic Resonance Imaging.

Introduction

Machine Learning (ML) is a branch of computer science that uses software and data analysis to develop programs that perform a task. For example, a computer can be taught to play chess, or a computer program can be trained to identify cats or dogs in a series of images. When doctors are looking for ways to diagnose patients who have a mental illness, machines can be used to do so by using ML software. It is interesting to note that ML software is not a new idea.

ML algorithms can efficiently leverage cohort information to create classifiers and assess the sensitivity and specificity of parameters connected to diagnostic validity to the initial and revised diagnostic test tools. ML algorithms have been employed to shorten several

scales, like the Social Responsiveness Scale (SRS) for behavioural differentiation between autism and attention-deficit/hyperactivity disorder (ADHD)¹.

Some of the areas where computers will play large role in the psychiatric field are not a surprise to those who study psychology. For example, after the development of Positron Emission Tomography (PET), the use of the PET scanner has been the basis for testing the effects of pharmaceuticals such as the antidepressant drugs like Prozac on the brain. Using the PET scanner, researchers are able to see the amount of serotonin being released into the brain. This is a very important aspect of drug treatment and development.

Magnetic resonance imaging (MRI) is an emerging technology that has enabled doctors to get a detailed view of a patient's brain as it functions and what is going on when a patient is undergoing a medical procedure.

Comorbidity is complex situation and it's hard to understand in the interpretation and diagnosis of

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psychiatric disorder. The notion of comorbidity was originally operationalized by Feinstein² when he had been worried with the medicating confounds of treating patients with disorders like rheumatic fever who concurrently suffered from multiple ailments. Conceptualising comorbidity, nevertheless, has not established so simple and considering by the Feinstein², not having a legitimate definition has contributed to it depicting a heterogeneous expression in the lack of its nosology. What's more, it's used synonymously with multimorbidity, though the latter is much more commonly known if the majority of disorders are non-defined within their own right, together with comorbidity compared, found as a coexistence of ailments³. In addition, in psychiatry, psychology, and mental health counselling; comorbidity was known as the existence and identification of more than one diseases happening in a person at precisely the exact same moment⁴. Here we reflect about the definition and reference it because the coexistence of not just two or more ailments but additionally, diseases which may be described as chronic and even though they may be pathologically associated with one another, they also behave independently⁵.

There are numerous conventional statistical approaches to examine if this routine suggests the greater chance of comorbidity of the above mentioned, however they take certain inherent limitations⁶. ML has revealed particular benefits in analyzing potential predictors concurrently in an impartial fashion, notably its capacity to spot patterns of data within useful attributes such as the prediction of an outcome of interest. Several researchers implemented ML methods on different medical data and information to examine whether comorbidity are significant longitudinal predictors of impaired cognition⁷.

ML can be used to check the capacity of every MRI step as an important biomarker for psychiatric diagnosis⁸. ML is made up of set of processes used to develop prediction models from empirical data to produce precise predictions about new information. Based upon the information three potential kinds of learning could be utilized, such as supervised learning, semi-supervised learning, and unsupervised learning. Supervised learning is done if all the information is tagged; semi-supervised learning is done whenever there is unlabeled data combined with tagged information; and,

unsupervised learning is done once all the information is unlabeled. Learning methods can be classified into linear and nonlinear procedures. Linear methods are more straightforward, while nonlinear methods are more elastic in character. Classification-based methods try to classify the information by different and categorical labels, whereas regression-based processes fit the data to a constant function and so work with constant tags to the information. For unsupervised learning, the approaches are mostly categorized as clustering approaches that set the information into clusters according to inherent similarities. Most of the researches have used supervised learning procedures to implement methods in their models⁹.

A major change in the field of Psychiatry and Neuropsychiatric is the potential use of technology to make diagnosis faster. We all need to realize that it can take time to find out what the root cause of a problem is. Using a computer, machine learning software with MRI and PET scanners can make a diagnosis faster and more accurate than the traditional methods.

This review paper stating the ML techniques applied with the use of fast and high performance computers and the use of latest digital technology for supporting the doctors for the diagnosis purpose and we can get reliable diagnosis. Section 1 is presenting the introductory view about the psychiatric disorder and about the ML techniques for psychiatric diagnosis in this paper. Section 2 present the reviews of different ML work in the area of psychiatric diagnosis. Finally the Section 3 presenting the conclusion and presenting the need of the wide scope of ML application in psychiatric diagnosis.

Related Work

ML approaches are sensitive to ease inference in the single-subject degree, and may identify spatially dispersed patterns in the mind which may be undetectable using set comparisons. Recently, an increasing number of studies have applied ML approaches to neuroimaging data to forecast and describe psychiatric ailments^{10,11}, in addition to Post Traumatic Stress Disorder (PTSD) With a Multivariate Voxel Pattern Investigation (MVPA) or supervised ML¹²; an individual can classify psychiatric disorder in person neuroimaging data. In keeping with this belief, it's been indicated further the multivariate patterns of mind changes detected by system learning

might be exceptionally sensitive to operational changes in the brain as a consequence of psychiatric disorder, and thus can facilitate the translation of neuroimaging in the chair to the bedside.

Sato et al.¹³ Implemented technique which includes four phases. In the first phase, SNPs together with the most discriminating info between the nutritious controls and schizophrenia sufferers are chosen to build a support vector machine outfit (SNP-SVME). In the second and third phase, Voxels from the fMRI map leading to classification are chosen to create yet another SVME (Voxel-SVME). In the fourth phase, the above three models are all combined to one module by means of a vast majority voting strategy to produce a last choice (Mixed SNP-fMRI). Experimental results demonstrate that better classification accuracy was attained by mixing genetic and fMRI information than using either alone, suggesting that genetic or mind function representing distinct, but partly complementary facets, of schizophrenia etiopathology. This study indicates an efficient means to reassess biological classification of people with schizophrenia, which can be potentially helpful for identifying diagnostically significant markers for the disease.

After emotional injury, why do some just some pieces of the traumatic event reunite as intrusive memories while some don't? Intrusive memories are crucial to cognitive behavioural therapy for post-traumatic anxiety disease, and an aetiological comprehension is justified. Clark et al.¹⁴ presented investigations using multivariate pattern analysis (MVPA) plus also a machine learning classifier to research if peri-traumatic brain stimulation managed to forecast later intrusive memories (i.e. until they'd occurred). To supply a methodological foundation for knowing the context of the recent outcomes, Clark et al.¹⁴ first demonstrate how functional magnetic resonance imaging (fMRI) through an experimental analogue of injury (an injury movie) via a potential event-related design managed to catch a person's subsequent intrusive memories. Results revealed widespread increases in brain activation at communicating when seeing a scene from the scanner which would later reunite as an intrusive memory from the actual world. All these fMRI results were duplicated in another study. Employing MVPA and also a machine learning classifier, it had been possible to forecast afterwards intrusive memories

around participants using 68% precision, and within a participant with 97% precision; i.e. that the classifier could identify from numerous scenes people who would later reunite as a intrusive memory. In addition, we report here mind networks crucial in intrusive memory forecast. MVPA unlocks the prospect of decoding brain action to rebuild idiosyncratic cognitive events with regard to understanding and forecasting mental health symptoms.

There are no neuroanatomical biomarkers of anorexia nervosa (AN) Accessible to create clinical Inferences in a single subject level. Lavagnino et al.¹⁵ provide results of a multivariate ML system using structural neuroanatomical scan information to distinguish a patient from matched healthy controls in a single subject level. Neuroanatomical volumes were pulled using the FreeSurfer applications and enter into the Least Absolute Shrinkage and Selection Operator (LASSO) multivariate ML algorithm. LASSO has been trained to spot book individual topics as a patients or wholesome controls. What's more, the model estimated that the probability that a single theme belonged to the A group according to a single scan. The model accurately predicted 25 from 30 subjects, translating into 83.3% accuracy (sensitivity 86.7 percent, specificity 80.0 percent) ($p < 0.001$; χ^2 evaluation). The predicted probabilities revealed a linear connection with drive for thinness clinical trials ($r = 0.52$, $p < 0.005$) and with body mass index (BMI) ($r = -0.45$, $p = 0.01$). The model attained a Fantastic predictive precision and drive for thinness revealed a powerful neuroanatomical Signature. These outcomes imply that neuroimaging scans combined with ML techniques have the potential to supply Information for an individual topic level that may be related to clinical results.

Cognitive behavioural treatment for psychosis (CBTp) entails assisting patients to understand and reframe threatening examinations of the psychotic experiences to decrease distress and boost operation. Whilst CBTp is successful for all, it isn't effective for many patients and the variables predicting a fantastic outcome remain poorly known. ML is a highly effective approach which enables new predictors to be identified within a manner that is qualitative, which may inform understanding of these mechanics inherent therapeutic interventions, and finally make predictions about

symptom development in the individual patient level. Thirty-eight patients having a diagnosis of schizophrenia finished a societal affect activity during functional MRI. The models predicted progress in psychotic ($r=0.63$, respectively $p=0.003$) and Profession ($r=0.31$, respectively $p=0.05$) symptoms after CBTp, but maybe not at the treatment-as-usual category ($n=16$). Psychotic symptom development has been called by neural responses to threat-related influence across sensor motor and frontal-limbic areas, whereas affective symptom development has been called by neural responses to fearful faces just in addition to prosocial influence across sensor motor and rectal areas. These findings imply that CBTp probably enhances psychotic and affective symptoms in people endorsing more threatening evaluations and mood-congruent processing biases, respectively that can be researched and reframed as a member of their treatment. This study enhances our comprehension of the neurobiology of therapy response and offers a base that will hopefully result in greater accuracy and tailoring of these interventions provided to patients¹⁶.

Neuroimaging studies have yielded considerable improvements in the understanding of neural systems pertinent to the development and persistence of dependence. Nevertheless, these improvements haven't researched widely for diagnostic precision in human subjects. Mete et al.¹⁷ create a statistical approach, with a ML framework, to properly classify brain pictures of cocaine-dependent participants along with wholesome controls. Within this analysis, a frame acceptable for educating possible brain areas that differed between the 2 groups was designed and implemented. Single Photon Emission Computerized Tomography (SPECT) images acquired through a saline extract in 3 cohorts of two - 4 week abstinent cocaine-dependent participants ($n=93$) and wholesome controls ($n=69$) were utilized to create a classification version. A data theoretic-based attribute selection algorithm was initially conducted to decrease the amount of voxels. A density-based clustering algorithm was then utilized to form spatially attached voxel clouds in three-dimensional space. A statistical classifier, Service Vectors Machine (SVM), was subsequently used for participant classification. Statistically insignificant voxels of spatially connected brain areas were eliminated iteratively and classification accuracy was reported via the iterations. A lot of the 30 chosen clusters are

highly pertinent to this addictive process, including areas pertinent to cognitive management, default style network associated self-referential believed, behavioural inhibition, and contextual memories. Relative Behaviour and hypo activity of regional cerebral blood circulation in brain areas in cocaine-dependent participants are introduced with corresponding amount of importance. The SVM-based strategy successfully categorized cocaine-dependent and healthy control participants with voxels chosen with info theoretic-based and statistical approaches from participants' SPECT data. The areas present within this study align with mind areas reported from the literature. These findings support the potential use of brain imaging and SVM-based classifier from the analysis of substance use disorders and furthering an understanding of their underlying pathology.

Conclusion

When the issue of psychiatric study was that there was insufficient information. Now, with all the speed of technological improvements that have happened in the current century at neuroimaging, we're at risk of becoming overwhelmed by a quantity of information which the individual brain, helped only by conventional statistical procedures, can't assimilate and incorporate. We suggest a set of alternatives to 21st century psychiatry's data overload problems is supplied by machine ML and specifically from a branch that's now often referred to as statistical learning. Besides these statements, prototypes learnt by ML techniques may assist in better understanding the features of each course. The percentage of these with the identification of psychiatric disorder in different medical data has been little.

Ethical Clearance: Permissions for carrying out the study were obtained from the Authorities at RKDF Medical College Hospital and Research Centre, Bhopal, Madhya Pradesh, India.

Source of Funding: Self

Conflict of Interest: Nil.

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Hospitalized Morbidity & Utilization of Beds in a Rural Health Training Centre

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Abstract

Background: Morbidity consumes a substantial portion of health care resources in a hospital. The overload in hospital ward remains a major source of concern in many countries, including India, for policy makers. The availability of beds is perhaps the single most important factor in determination of the hospital utilization in a country. **Objective:** To determine the pattern of hospitalized morbidity, hospital bed utilization by different morbidity and length of stay in the Rural Health Training Centre (RHTC). **Observation:** A total of 528 patients were admitted in RHTC of which max, 53% were females with mean age of male and female patients were 48.15yrs (SD=19.22) and 40.39yrs (SD=16.64) respectively. Max, 22.9% patients were in age group 26-35 years. Max. 38.6% hospitalized morbidity was mainly due to viral fever followed by gastroenteritis, 21.5% and among the total anaemic admissions, higher proportion, 70% was belonged to females. Length of stay due to hospitalised morbidity range from one to four days of which max length of stay was seen in age 46 to 55 yrs and mainly due to enteric fever.

Overall bed occupancy rate due to hospitalized morbid condition during study period was 54.92%. Bed occupancy rate was high, 17.91% due to viral fever followed by gastroenteritis, 15.05%, and enteric fever (10.38%) respectively. However, maximum length of hospital stay ,4 days was mainly due to enteric fever and variation within disease about the length of stay in hospital is found significant. **Conclusion:** Hospitalized utilization in rural area is mainly due to infectious diseases and need efforts to sensitize the poor and neglected sector of rural community to access the health care services for positive health.

Keywords: Morbidity, bed utilization, length of stay, RHTC

Introduction

Morbidity consumes a substantial portion of health care resources in a hospital. The overload in hospital ward remains a major source of concern in many countries, including India, for policy makers. The availability of beds is perhaps the single most important factor in determination of the hospital utilization in a country. ^[1]

In India, shortage of hospital beds is a huge problem, the average bed population ratio being 9 per 10,000 populations in comparison with the world average of 27 per 10,000 during 2000-2009. As the demand for health care increases, a high efficiency on limited resources is necessary for affordable high-patient service levels. ^[2,3]

A possible way to minimize the problem of scarcities of beds is to look for variation in bed utilization by different causes across the country and plan services accordingly. This information also provides the basis for patient care and bed management in a hospital. There are many factors affecting bed utilization, namely the allocation of beds, patient placement and patient admission policies, etc.^[4] Similarly, in Indian communities, the access of health care services and

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utilization of hospital bed influenced by factors such as social, economic, educational and cultural characteristics of people as well as attitude and habit towards medical profession. The present study aimed to know the habit of rural Indian community towards utilization of hospital beds from Rural Health Training Centre (RHTC).

Materials and Method

It was a descriptive study with retrospective analysis of records conducted in the in-patient Department of Rural Health Training Centre (RHTC), Kasegaon, under Dept. of Community Medicine, Krishna Institute of Medical Sciences (KIMS), Karad provide primary health care services to needy and poor people free of cost. The study involved the analysis of records of patients admitted for a period of year 2014. Data was extracted from the admission and discharge registers maintained at RHTC. This centre has 10 in-patient beds (5 General & 5 ANC). Only planned surgeries are done under consultation with KIMS, Karad. Critical cases & infectious diseases (e.g Cholera etc.) are not admitted in this hospital, they are referred to tertiary health care centre (KIMS Karad). A Medical Officer is available for consultation round-the-clock. All the patients coming to this hospital are working in farm and farm related occupations. Before conducting this study, approval was obtained from the Institutional Ethics Committee.

The investigators abstracted all the medical

records from the in-patient department records using a pre-designed data collection tool. The information obtained included morbidity (illness or events that lead to hospitalization) and clinical & therapeutic details (history of illness, physical examination, laboratory investigation, diagnosis, duration of illness and length of stay in hospital).

Average length of stay: The average period (days) of stay in the hospital per admitted patient⁵.

Bed Occupancy rate: Percentage of occupancy of hospital beds. [5]

The primary condition requiring hospitalization was noted as the main diagnosis. The patients admitted to general ward were utilized for present study; however ANC beds were excluded from present study. All the data collected was entered in to the Excel sheet & analyzed by applying statistical tests i.e. Proportion, Averages and tests of significance (Chi-square test).

Results

A total of 528 patients were admitted in RHTC during a year 2014 of which 248 and 280 belonged to male and female gender with mean age 44.2 years and ranges between 16 – 85 years with mean age of male and female patients were 48.15yrs (SD=19.22) & 40.39yrs (SD=16.64) respectively.

Table 1: Distribution of the study population according to age group & Gender

Age group (Yrs)	Frequency (%)			χ^2	P
	Male	Female	Total		
16 – 25	48 (45.2) (19.3)	58 (54.7) (20.7)	106(20.0)	28.2	0.0001*
26 – 35	41 (33.8) (16.5)	80(66.1) (28.5)	121(22.9)		
36 – 45	40 (37.7) (16.1)	66 (62.2) (23.5)	106(20.0)		
46 – 55	31 (64.5) (12.5)	17(35.4) (06.0)	48(09.0)		
56 – 65	27(57.4) (10.8)	20 (42.5) (07.1)	47(08.9)		
66 – 75	55 (61.7) (22.1)	34 (38.2) (12.1)	89(16.8)		
76 – 85	06(54.5) (02.4)	05 (45.4) (01.7)	11(02.0)		

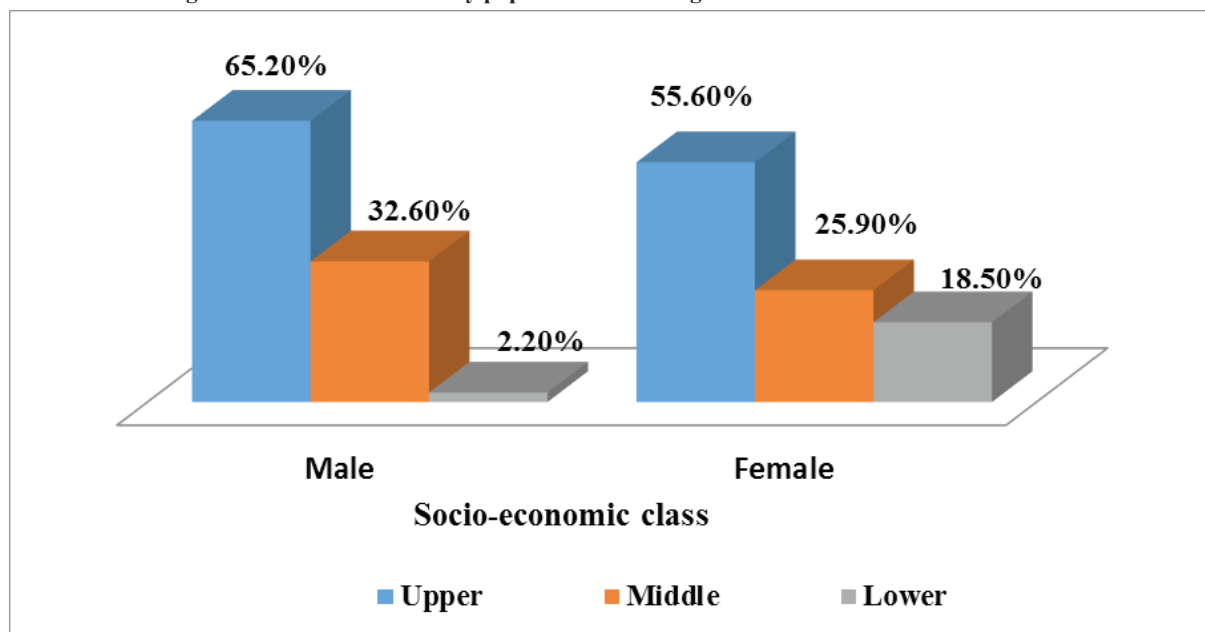
Table 1 revealed that max, 22.9% patients were in age group 26-35 years followed by 20% each in 16-25 and 36-45 years respectively. Among male and female patients max, 22.1% and 28.5 % were from age group 66-75 yrs and 26-35 yrs respectively. There is significant association between hospitalized morbidity patterns of gender with respect to age as reported by $p < 0.05$ at 95% confidence level.

Table 2: Distribution of study population according to occupation

Occupation (Male)	Frequency	%	Occupation (Female)	Frequency	%
Farmers	99	39.9	Housewife	206	73.5
Service	37	14.9	Service	27	09.6
Student	21	08.4	Student	11	03.9
Factory worker	17	06.8	Labour	36	12.8
Ex-serviceman	07	02.8			
Labour	67	27.0			

Table 2 shows max; 39.9.2% male patients were farmer followed by labours, 27% whereas max, 73.5% female were engaged with household duties followed by 12.8% as daily wedge labours.

Figure 1: Distribution of study population according to socio-economic status & Gender



According to fig 1, max, proportions of male (65%) and female (55%) patients were belonging to upper socio-economic class whereas significantly few male patients (2.2%) were belonging to lower class compared

to female patients (18.50%) according to modified B.G. Prasad socio-economic classification(2018) and the difference in proportions were found statistically significant ($\chi^2 = 14.30, p = 0.008^*$).

Table 3: Distribution of study subjects according to Disease and Gender

Morbidity	Frequency (%)			χ^2	P
	Male	Female	Total		
Respiratory diseases	28 (42.4) (11.2)	38 (57.5) (13.5)	66(12.5)	21.2	0.007*
Gastroenteritis	68 (59.6) (27.4)	46 (40.3) (16.4)	114 (21.5)		
Viral fever	88 (43.1) (35.4)	116 (56.8) (41.4)	204(38.6)		
Enteric fever	37 (60.6) (14.9)	24 (39.3) (08.5)	61(11.5)		
U.T.I	09 (39.1) (03.6)	14(60.8) (05.0)	23(04.3)		
Anaemia	18(30.0) (07.2)	42 (70.0) (15.0)	60(11.3)		

Max. 38.6% hospitalized morbidity was mainly due to viral fever followed by gastroenteritis, 21.5% and among the total anaemic admissions, higher proportion, 70% was belonged to females. Among males, higher admission rate, 35.4% was seen due to viral fever followed by gastroenteritis, 27.4% and enteric fever, 14.9% however; in females, 41.4% due to viral fever followed by gastroenteritis, 16.4% and anaemia by 15% respectively. The proportion of admissions due to gastroenteritis and enteric fever was seen higher in males 27.4% and 14.9% as compared to females. The gender and hospitalized morbidity was significantly associated to each other as denoted by p value which is <0.05 at 95% confidence interval (Table 3).

Table 4: Distribution of study subjects according to length of stay in hospital

Age group (in years)	Length of stay (in days)				Student t test	P
	Minimum	Maximum	Mean	S.D		
16 – 25	1	3	1.45	0.60	3.59	0.001*
26 – 35	1	3	1.91	0.79		
36 – 45	1	3	2.65	0.74		
46 – 55	1	4	1.87	1.12		
56 – 65	1	3	1.80	1.12		
66 – 75	1	3	1.52	0.87		
76 – 85	1	1	1.00	0.00		

According to table 4, patients with age group 46 to 55yrs stayed for maximum duration, 4 days in hospital as compared to other age groups. Mean duration of stay in hospital among male (1.95 ± 0.89) was more as compared to female (0.56 ± 0.56) patients and difference was found statistically significant (t value 3.59, $p < 0.001$).

Table 5: Distribution of study subjects according to Bed- days utilization

Morbidity	Length of stay				Bed days occupied	Proportion of bed days occupied/1820 (%)	ANOVA	p
	Min.	Max.	Mean	S.D				
Respiratory diseases	1	3	1.2	0.57	79	4.34	16.49	0.001*
Gastroenteritis	1	3	1.9	0.62	274	15.05		
Viral fever	1	3	1.6	0.64	326	17.91		
Enteric fever	3	4	3.1	0.40	189	10.38		
U.T.I	2	3	2.6	0.54	60	3.29		
Anaemia	1	2	1.2	0.49	72	3.95		

Overall bed occupancy rate due to hospitalized morbid condition during study period was 54.92%. Bed occupancy rate was high (17.91%) due to viral fever followed by gastroenteritis (15.05%) and enteric fever (10.38%) respectively. However, maximum length of hospital stay (4 days) was mainly due to enteric fever and variation within disease about the length of stay in hospital is found significant ANOVA ($F=16.49$, $p < 0.001$) (Table 5).

Discussion

Present study revealed that maximum proportions of patients admitted to RHTC were in age group 26 to 45 yrs with high proportion of females i.e. 53%. The max, proportion of male and female patients admitted was with good economic status with mean age, males and female was 48.15yrs (SD=19.22) and 40.39yrs (SD=16.64) respectively. A study conducted by Rahman M et al⁶ in Dhaka observed that 80% respondents were age of 16-45 yrs and max, 60% were females with max, 61.42% respondents were found good socio-economic status. Similar findings also observed by Hussain S et al⁷ in Karachi, Pakistan. Study conducted by Ashok Kumar T et al⁸ in south India also observed that hospitalization proportion among female was more i.e.53.1%. It indicates that immunological status among rural female population is poor may be due to high prevalence of anaemia, poor nutritional status and

may be household anxiety also. Socio-economic status influences people to seek medical services as directly associated with education and positive attitude, however fear of loss of wages, negative attitude and illiteracy affect the hospitalization by poor even though health care services provided by free of cost.

Our study observed that max. 38.6% patients were admitted due the Viral fever followed by 21.5% Gastroenteritis and 12.5% Respiratory diseases respectively. Proportion of patients admitted for diseases like Urinary Tract Infection, Enteric fever and Anaemia range 4.3% to 11.5%. Rahman M et al⁶ also found that viral fever was prominent morbid condition, 53.5% for hospitalization followed by Arthritis-22.5% and Diarrhoea -8.5%. Similar morbidity pattern also observed by Hussain S et al⁷ i.e. 26.53% respondents were suffered from respiratory infections. This is mainly due to rural residence, exposure to various allergic particles as well as field activities and consumption of untreated water from irrigated fields. However study conducted in Saudi by Abdullah I et al⁹ observed 60% hospitalization due to respiratory infections which was mainly due to summer study period and maximum use of cold items.

The average length of hospital stay in our study range from one to four days, similar observation i.e. 3.2 days reported by Alan J. Crockett et al¹⁰ in South Australian

hospital. However study conducted by E.Ravi Kiran^[11] in South India observed 6 to 12 days and difference was mainly due to geographical variations, study setting and subjects.

Conclusion

Communicable diseases are still big problem in rural India which leads to hospitalization, similarly women's health is again need to be highlighted and services should be rendered as per need and health status of community.

Ethical Clearance: Taken from Krishna Institute of Medical Sciences Institutional Ethical committee.

Conflict of Interest: None declared.

Source of Funding: Self.

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Variation in Blood Pressure and Pulse in Inter-arms and Its Management

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Abstract

Background: Blood pressure is vital sign, along with heart rate, oxygen saturation, respiratory rate and body temperature. Blood pressure, in normal adult, is approximately 120/80 mmHg. Difference between measured systolic and diastolic pressures is called pulse pressure. Pulse pressure is due to cardiac output. Blood pressure should be measured in both arms at first visit because differences exist and measurement in only one arm may lead to under diagnosis of hypertension. Confirmation of an inter-arm difference requires a method of repeated simultaneous measurement, to avoid overestimation of prevalence.

Method: Apparatus used is digital sphygmomanometer. Blood pressure and pulse rate is measured of both arms, thrice each time, concordant readings are considered and noted for this purpose of blood pressure and pulse rate in different age groups persons.

Result: Total Persons investigated of different age groups = 1126, Males = 517, Females = 609, total SBPV in range of 0-10mmHg =936, 11-20mmHg=178, 21-30mmHg=12. DBPV in range of 0-10mmHg=1097, 11-20mmHg= 26, 21-30mmHg=3. PV=26, 0-10mmHg=1109, 11-20mmHg=15, 21-30mmHg=2. Diseased persons=325, Normal persons=801.

Conclusion: Variation in blood pressure and pulse rate in inter-arms observed in different age groups from 0-10mmHg to 21-30mmHg. More variation may show cardiovascular disease in individual. Total person investigated are 1126 out of which 801 are normal and 325 are suffering with hypertension, diabetes, hypertension with diabetes and hypotension. Maximum variation is found in 0-10mmHg in systolic blood pressure, diastolic blood pressure and pulse which is not showing significant diseases and minimum in 21-30mmHg which is showing cardiovascular diseases and their probabilities.

Keywords: Digital sphygmomanometer; systolic blood pressure, diastolic blood pressure, pulse rate.

Introduction

Blood pressure is vital sign, along with heart rate, oxygen saturation, respiratory rate and body temperature. Blood pressure, in normal adult, is

approximately 120 millimetres of mercury systolic, and 80 millimetres of mercury diastolic means “120/80 mmHg”.¹ Difference between the measured systolic and diastolic pressures is called pulse pressure. The pulse pressure is due to cardiac output. The magnitude of the pulse pressure is usually attributed to the interaction of the stroke volume of the heart, the ability to expand of the arterial system—largely attributable to the aorta and large elastic arteries—and the resistance to flow in arterial tree.² The inter-arm difference in blood pressure was discovered first by Osler in 1915.³ The blood pressure should be measured

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in both the arms at the first visit to avoid differences exist and under diagnosis of hypertension.^{4,5} Confirmation of an inter-arm difference requires a method of repeated simultaneous measurement to avoid overestimation of prevalence.^{6,7} Both arms measurement of blood pressure is important to prevent the misdiagnosis of hypertension due to normal differences in blood pressure in inter-arms.⁸ When both arms are measured, it has been suggested that simultaneous measurement of both arms seems preferable since sequential measurement of blood pressure overestimates the prevalence of systolic inter-arm difference.⁹ A systolic blood pressure difference in inter-arms is one risk marker that is easily measured clinically with no additional equipment. Differences in inter-arms can cause errors in blood pressure interpretation and management when not recognized.¹⁰⁻¹⁴ The new clinical guideline for hypertension from the National Institute for Health and clinical Excellence considers less than 10mmHg inter-arm difference as normal and attributes more than 20 mm Hg to underlying vascular disease.¹⁵ An inter-arm difference in blood pressure of 10-20 mm Hg, suggesting

15% of the population with hypertension.¹⁶ The recent European Guideline on Hypertension gives a more precise description of this by stating that in the event of a significant (>10mmHg) and consistent Systolic Blood Pressure difference in inter-arm, the arm with the higher Blood Pressure values should be used.¹⁷ Stergiou et al. pointed out that clinical blood pressure measurements had a standard deviation of differences between two sets of measurements of 10.4mmHg, systolic.¹⁸

Material and Method

The apparatus used is digital sphygmomanometer. The blood pressure and pulse rate is measured of both the arms, thrice, the concordant readings are considered and noted for this purpose of blood pressure and pulse rate in different age groups persons. The data is collected from different rural areas by collecting the people on some fixed places or by visiting in different rural areas. The cuff is tied in the upper region of the arms and the instrument is put on the level of the chest.

Table-1: SBPV, DBPV and PV in Normal and Diseased persons in different age groups:

S.No.	Age Group	Total Persons (Male+Female)	SBP V	DBPV	PV	Normal	Diseased
1.	10-20	18 =[4+14]	0-10=18 11-20=0 21-30=0	0-10=18 11-20=0 21-30=0	0-10=18 11-20=0 21-30=0	18	0
2.	21-30	76 =[19+57]	0-10=63 11-20=13 21-30=0	0-10=75 11-20=1 21-30=0	0-10= 75 11-20=1 21-30=0	76	0
3.	31-40	144=[41+103]	0-10=125 11-20=19 21-30=0	0-10=142 11-20=2 21-30=0	0-10=140 11-20=4 21-30=0	134	10
4.	41-50	248=[117+131]	0-10=219 11-20=27 21-30=2	0-10=247 11-20=1 21-30=0	0-10=247 11-20=1 21-30= 0	197	51

Cont... Table-1: SBPV, DBPV and PV in Normal and Diseased persons in different age groups:

5.	51-60	273=[126+147]	0-10=230 11-20=41 21-30= 2	0-10=265 11-20=8 21-30= 0	0-10=273 11-20=0 21-30=0	159	114
6.	61-70	202 =[106+96]	0-10=157 11-20=41 21-30=4	0-10=195 11-20=6 21-30= 1	0-10=198 11-20= 3 21-30= 1	126	76
7.	71-80	136=[80+56]	0-10=102 11-20=30 21-30= 4	0-10=128 11-20=6 21-30=2	0-10=130 11-20=5 21-30= 1	67	69
8.	81-90	25 =[20+5]	0-10=19 11-20= 6 21-30= 0	0-10=24 11-20=1 21-30=0	0-10=25 11-20=0 21-30=0	21	4
9.	91-100	4 =[4+0]	0-10=3 11-20=1 21-30= 0	0-10=3 11-20=1 21-30=0	0-10=3 11-20=1 21-30=0	3	1
	Total	1126= [517+609]	1126	1126	1126	801	325

SBPV= Systolic Blood Pressure Variation, DBPV=Diastolic Blood Pressure Variation

PV= Pulse Variation, ANC = Antenatal Cases, HTN= Hypertension, DM-II=Diabetic Mellitus Type –II, CAD = Coronary Artery Disease, HTN with DM-II= Hypertension with Diabetic Mellitus type-II, M=Male, F =Female

Result

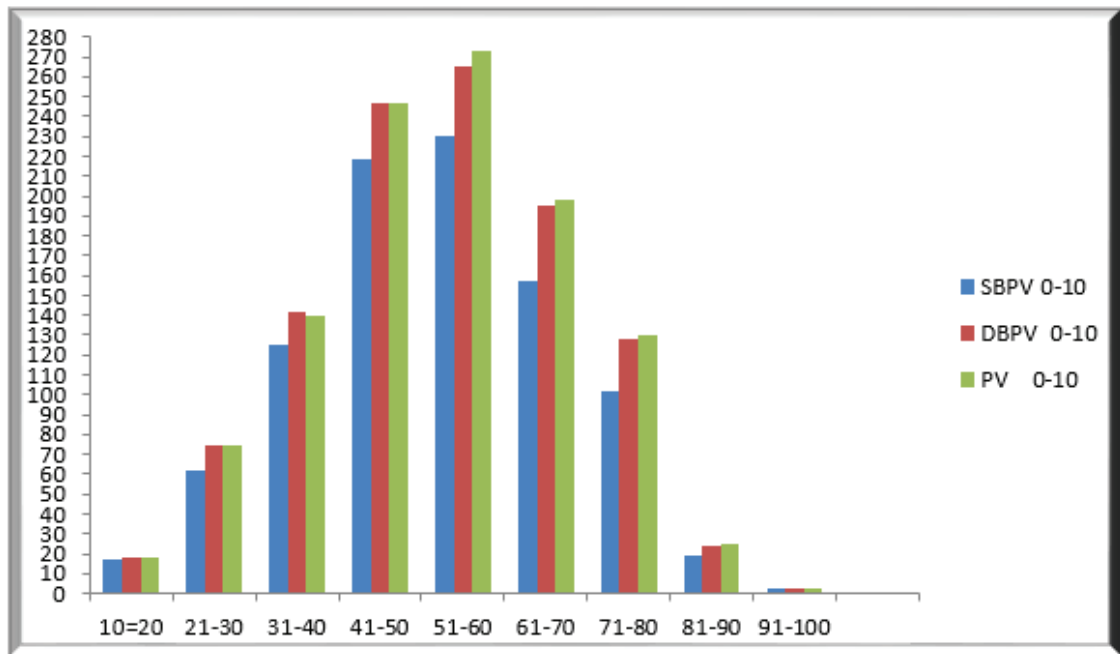
Total Persons of different age groups = 1126, Males = 517, Females = 609

Table 2: Inter-Arms SBPV, DBPV and PV in different persons:

Particulars of Persons	Persons in 0-10 mmHg variation	Persons in 11-20 mmHg variation	Persons in 21-30 mmHg variation	Total Persons	Diseased Persons/ Percentage	Normal Persons/ Percentage
Systolic Blood Pressure Variations	936	178	12	1126	325 (28.86%)	801 (71.14%)
Diastolic Blood Pressure Variations	1097	26	3	1126		
Pulse Variations	1109	15	2	1126		

Figure-1: SBPV, DBPV and PV in 0-10mmHg and Patients of different age groups:

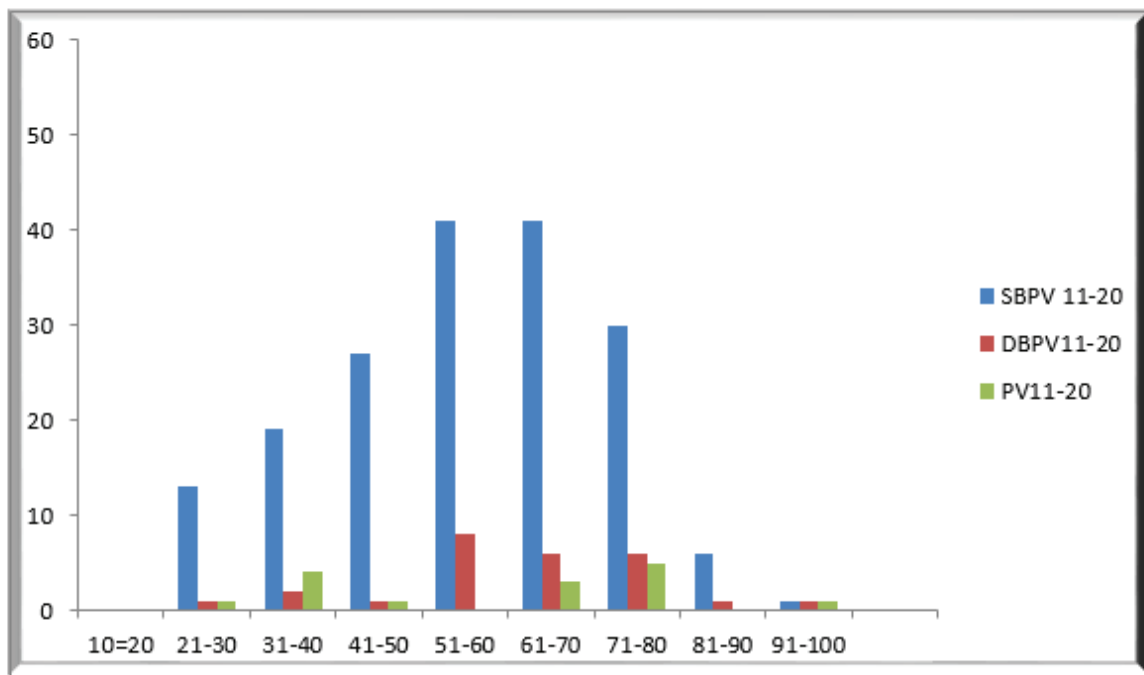
↓ Number persons of SBPV, DBPV & PV in 0-10mmHg range



→ Patients of Different age groups

Figure-2: SBPV, DBPV and PV in 11-20mmHg and Patients of different age groups:

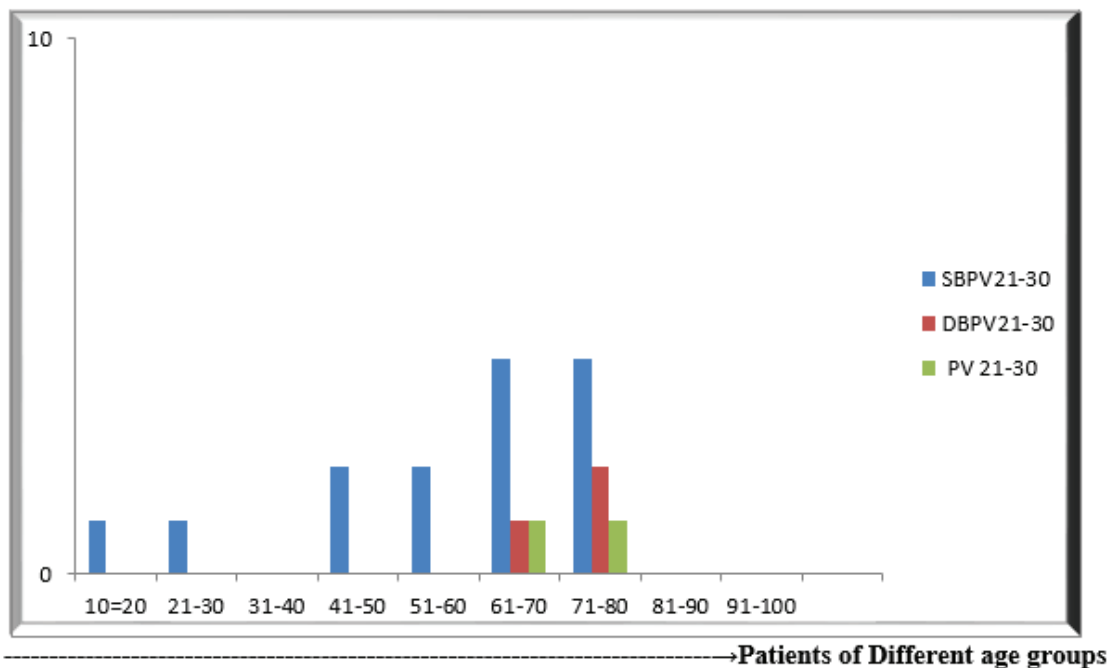
↓ Number persons of SBPV, DBPV & PV in 11-20mmHg range



→ Patients of Different age groups

Figure-3: SBPV, DBPV and PV in 21-30mmHg and Patients of different age groups:

↓ Number persons of SBPV, DBPV & PV in 21-30 Points range



Discussion

Total persons whose blood pressures and pulse rates are detected with the help of digital sphygmomanometer are 1126 out of which 517 are males and 609 are females, in different age groups. The normal persons are 801 and the diseased subjects are 325 which are suffering from hypertension, diabetes and hypertension with diabetes. In age group 10-20, total persons investigated are 18, the SBPV from 0-10 mmHg variation is in 18 persons, DBPV is in 18 and PV is in 18 persons where as 0 subject is in the 11-20 mmHg variation and in 21-30 mmHg variation. In age group 21-30, total persons are 76, the SBPV from 0-10 mmHg variation is in 63 persons, DBPV is in 75 and PV is in 75, in 11-20 mmHg variation, 13 SBPV, 1 DBPV and 1 PV, in 21-30mmHg variation, persons are nil. In age group 31-40, 144 are total persons out of which 0-10 mmHg variation SBPV is in 125, DBPV is in 142, PV is in 140. In 11-20 mmHg variation SBPV 19, DBPV 2, PV 4. In age group 41-50, total persons are 248, in 0-10 mmHg variation SBPV are 219, DBPV are 247, PV are 247, in 11-20 mmHg variation, SBPV are 27, DBPV and PV is 1, in 21-30 mmHg variation, SBPV are 2, DBPV and PV is 0. In age group 51-60, total persons are 273, in 0-10 mmHg,

SBPV are 230, DBPV are 265, PV are 273, in 11-20 mmHg, SBPV are 41, DBPV is 8 and PV is 0, in 21-30 mmHg, SBPV are 2, DBPV and PV is 0. In age group 61-70, total persons are 202, in 0-10 mmHg variation SBPV are 157, DBPV are 195, PV are 198, in 11-20 mmHg variation, SBPV are 41, DBPV are 6 and PV are 3, in 21-30 mmHg variation, SBPV are 4, DBPV and PV is 1 each. In age group 71-80, total persons are 136, in 0-10 mmHg variation SBPV are 102, DBPV are 128, PV are 130, in 11-20 mmHg variation, SBPV are 30, DBPV are 6 and PV are 5, in 21-30 mmHg variation, SBPV are 4, DBPV are 2 and PV is 1. In age group 81-90, total subjects are 25, in 0-10 mmHg variation SBPV are 19, DBPV are 24, PV are 25, in 11-20 mmHg variation, SBPV are 6, DBPV is 1 and PV is 0, in 21-30 mmHg variation, SBPV, DBPV and PV is 0. In age group 91-100, total persons are 4, in 0-10 mmHg variation SBPV are 3, DBPV are 3, PV are 3, in 11-20 mmHg variation, SBPV, DBPV and PV is 1 each, in 21-30 mmHg variation, SBPV, DBPV and PV is 0 each. Various diseases significantly influenced the increase in Blood Pressure as showed by Weinberg et al.¹⁹ that an inter-arm Systolic Blood Pressure difference is common and associated with a significant increased risk for future

cardiovascular events, even inter-arm difference is modest. Igarashi et al. reported that inter-arm difference in blood pressure might regard as a simple marker for coronary and peripheral artery diseases.²⁰The mean blood pressure difference for left-arm and right-arm was higher in some cases but found statistically insignificant as reflected in the reportings of Pesola et al.²¹Imaging evidence at lower levels of inter-arm difference such as 10 or 15 mmHg is scarce and inconclusive.²²The differences in inter-arms are associated both with wider pulse pressures.²³

Management:

Further studies of the measurement and implications of an inter-arm difference are needed. The effect of the full protocol in reducing apparent prevalence suggests that future epidemiological studies of inter-arm difference must adopt a similar robust repeated simultaneous measurements approach to avoid overestimation of prevalence.²⁴It is recommended that digital sphygmomanometer should be made for measurement of the blood pressure of inter-arms on the same time to avoid the error of variation of blood pressure and pulse rate. The accuracy of the readings is detected. The apparatus may have two cuffs to tie both sides and should be attached to a single instrument. The readings on the monitor should be different for both arms with one conclusive reading on the screen.

Conclusions

The variation in inter-arms in SBPV and DBPV and pulse variation is observed when detected with digital sphygmomanometer, thrice in each arm and concordant readings are noted each time. Variation in blood pressure and pulse rate in inter-arms observed in different age groups from 0-10mmHg to 21-30mmHg. More variation may show the cardiovascular disease in individual. Total person detected are 1126 out of which 801 are normal and 325 are suffering with hypertension, diabetes, hypertension with diabetes and hypotension. Maximum variation is found in 0-10mmHg in systolic blood pressure, diastolic blood pressure and pulse which is not showing significant diseases and minimum in 21-30mmHg which is showing cardiovascular diseases and their probabilities.

Conflict of Interest: No conflict of interest.

Source of Funding: Self.

Ethical Clearance: No experiment has been done on any animal or human beings. This manuscript is ethically clear.

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Role of Fine Needle Aspiration Cytology in Classifying Breast Lesions with Special Reference to Borderline Cases

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Abstract

Introduction- FNAC is a valuable tool in the preoperative assessment of breast masses with a primary goal to separate malignant from benign masses.

Material and Methods- This study was conducted on 300 cases presenting with breast lump during the last 3 years in a tertiary care hospital of Western Uttar Pradesh. FNAC was performed in all the cases and smears were analysed and categorised according to NBSBSP classification. Cytohistologic correlation was done wherever possible.

Results- Age of patients ranged from 8 years to 74 years with mean age of 32.4 years and female to male ratio of 20.08:1. Majority of aspirates were in C2- benign category followed by C5 malignant, C4 suspicious and C3 atypical respectively. Maximum number of aspirates were reported as fibroadenoma 42.27 % followed by fibrocystic disease 33.7%. 9.12% were diagnosed as malignant lesions of which infiltrating ductal carcinoma (89.65%) was the commonest.

Conclusion- FNAC is a safe, cost effective, highly sensitive and specific outpatient procedure useful in early diagnosis and management of breast lesions and at times obviating the need of surgery. Borderline (gray zone) lesions should be followed up.

Keyword- Breast lump, FNAC, Gray zone lesions.

Introduction

Breast lump is the most common presentation in most of the breast diseases. The triple assessment of breast disease by clinical examination, mammography and Fine Needle Aspiration Cytology (FNAC) has been reported as 100% accurate in diagnosis of breast disease¹. FNAC is a valuable tool in the preoperative assessment of breast masses with a primary goal to separate malignant from benign masses as malignant

requires radical therapy and benign can be managed conservatively².

FNAC of breast lump has various benefits over open tissue biopsy. It is highly sensitive ranging from 82% to 97.5% and with specificity of >99%, easy to perform, minimally invasive and cost effective that can be performed at outpatient department with results available within shorter time and helps in planning of treatment in the breast lump^{3,4}. We can also perform molecular ancillary techniques, that is progesterone receptor (PR) and estrogen receptor (ER), proliferation antigen (Ki67) and DNA pattern analysis^{5,6}.

FNAC helps in differentiating benign from malignant but there are certain diseases in which the morphological features are overlapping such as cellular fibroadenoma, proliferative breast disease with atypical

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hyperplasia, papillary lesions and low grade carcinoma making them difficult to be categorised.

However, to overcome this difficulty a standard system of reporting breast FNAC was given by National Health Service Breast Screening Program (NHSBSP)⁷ comprising of categories C1 to C5. C1-Inadequate, C2-Benign, C3-Atypical, probably benign, C4-Suspicious, C5-Malignant. C3, C4 categories consists of gray zone lesions and these are further subjected to biopsy.

The present study was conducted to evaluate the spectrum of breast lesions on aspiration cytology, to classify them according to NHSBSP and to identify the borderline cases.

Material and Methods

This study was conducted on 300 cases presenting with breast lump during the last 3 years in a tertiary care hospital of Western Uttar Pradesh. Inclusion criteria were cases presenting with palpable breast lump and breast lesion detected on radiology.

The cases with nipple discharge without palpable breast lump were excluded from the study.

FNAC of palpable breast lump was performed with a 22-24 gauze disposable needle attached to a 10 ml disposable plastic syringe fitted in syringe holder and sample was obtained by to and fro motion.

Smears were prepared and half slides were fixed in 95% ethyl alcohol for Haematoxylin & Eosin (H & E) and Papanicolaou(PAP) stain and remaining were air dried for Leishman-Giemsa stain.

FNAC smears were studied in detailed for findings of inflammation, benign breast disease, suspicious and malignant lesions and they were classified according to NHSBSP,2011⁷. The cytomorphological features of borderline lesions (gray zone) were analysed specifically to establish a criteria which would help in classifying these lesions.

For cytohistopathological correlation, formalin fixed paraffin embedded H & E stained sections were studied.

Results

A total of 300 cases presented with breast lump, of which bilateral disease was seen in 18 cases therefore 318 breast lumps were observed.

Table 1 : AGE AND SEX WISE DISTRIBUTION

Age Group (In Years)	Females		Males		Total (%)	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
1-10	1	0.33	0	0	1	0.33
11-20	52	17.33	1	0.33	53	17.67
21-30	95	31.67	7	2.33	102	34
31-40	79	26.33	0	0	79	26.33
41-50	42	14	2	0.67	44	14.67
51-60	11	3.67	2	0.67	13	4.33
61-70	7	2.33	0	0	7	2.33
71-80	0	0	1	0.33	1	0.33
TOTAL	287	95.67	13	4.33	300	100

Age of patients ranged from 8 years to 74 years with mean age of 32.4 years. Majority of patients were in third decade 34% (102/300) cases, followed by 26.33% and 18% in 4th and 2nd decade respectively. There were 95.67% (287/300) female and 4.33% (13/300) males. Female : Male ratio was 22.08:1 (Table 1).

TABLE 2 : CATEGORISATION OF CYTOLOGICAL DIAGNOSIS

CYTOLOGICAL CATEGORY	TOTAL NUMBER OF ASPIRATES	PERCENTAGE (%)
C1	17	5.35
C2	246	77.35
C3	11	3.46
C4	15	4.72
C5	29	9.12
TOTAL	318	100

Majority of aspirates were in C2- benign category followed by C5 malignant, C4 suspicious and C3 atypical respectively.(Table 2).

17 out of 18 bilateral cases showed similar cytological category C2 on both sides while in one case categories were different C4 in right side and C5 in left side.

TABLE 3: SPECTRUM OF BENIGN LESIONS – C2

C2 CATEGORY		NUMBER OF ASPIRATES	PERCENTAGE (%)
Non proliferative breast disease	Fibrocystic disease	83	33.7
Proliferative breast disease without atypia	Epithelial hyperplasia	03	1.22
Benign Tumours	Fibroadenoma	104	42.27
	Benign phylloides tumour	01	0.41
	Intraductalpapiloma	01	0.41
	Lactational adenoma	04	1.63
Non-neoplastic and miscellaneous	Acute mastitis / abscess	13	5.28
	Galectocele	12	4.90
	Gynaecomastia	07	2.84
	Duct ectasia	06	2.45
	Chronic mastitis	04	1.63
	Fat necrosis	03	1.22
	Granulomatous inflammation	03	1.22
	Retention cyst	01	0.41
	Epidermal cyst	01	0.41
	TOTAL	246	100

Out of benign cases maximum number of aspirates were reported as fibroadenoma 42.27 % followed by fibrocystic disease 33.7% (Table 3).

TABLE 4 : SPECTRUM OF MALIGNANT LESIONS - C5

C5 CATEGORY	NUMBER OF CASES	(PERCENTAGE) %
Infiltrating Ductal Carcinoma	26	89.65
Infiltrating Lobular Carcinoma	01	3.45
Mucinous (Colloid) carcinoma	01	3.45
Medullary Carcinoma	01	3.45
TOTAL	29	100

29 out of 318 (9.12%) breast FNACs were diagnosed as malignant lesions. Majority of cases were infiltrating ductal carcinoma (89.65%). (Table 4).

TABLE 5 : CYTO-HISTOPATHOLOGICAL CORRELATION

CYTOLOGICAL CATEGORY	CYTO-HISTOPATHOLOGICAL CORRELATION		TOTAL
	YES	NO	
C2	35	1	36
C3	3	1	4
C4	6	1	7
C5	8	0	8
TOTAL	52	3	55

Out of 318 aspirates, histopathological sections were available in 55 aspirates (17.29%). FNAC findings correlated with histopathological diagnosis in 52 cases and 3 aspirates showed discrepancy. (Table 5).

One case was diagnosed as benign on cytology, on histology it turned out to be infiltrating ductal carcinoma with insitu component. Another case was diagnosed as cystic lesion with occasional atypical cells this also turned out to be infiltrating ductal carcinoma with extensive cystic changes with haemorrhage. Third case was given as suspicious for malignancy on cytology, on histology it was diagnosed as fibrocystic disease with florid epitheliosis and focal atypical changes. Considering histopathology as gold standard for diagnosis the p value for cytohistopathological correlation was significant (p value < 0.05). Overall sensitivity was 87.5%, specificity

97.4%, positive predictive value 95%, negative predictive value 94.5% and diagnostic accuracy was 98.3%.

Discussion

FNAC plays an important and essential role in the management of patients with breast lesions and also offers a great potential for prediction of patient's outcome, disease response to therapy and assessment of risk of developing breast cancer.⁸

Female sex and increasing age are the strongest risk factors for breast cancer.⁹In present study, age of the

patients ranged from 8 years – 74 years with the mean age of 32.4 years. Majority of the patients were in 3rd decade 34% (102/300 cases), followed by 26.3 % in 4th decade. Similar findings were observed by Khandaza et al.¹⁰

There was female preponderance (95.67 %, 287/300 cases) with F:M ratio of 22.08:1. This was in accordance with various studies^{2,11,12} which reported F:M ratio ranging from 14:1 to 24.5:1

Breast lump was the commonest clinical presentation, as it was the inclusion criteria, followed by pain and fever in 20.67% (62/300) and 7.67% (23/300) cases respectively. Chandanwale et al² and Shirley et al¹² also observed that lump was the most common presenting symptom in their studies observed in 100% and 67.8% respectively.

Cytological categorization from C1-C5 category for FNAC breast is a cost effective and practical procedure for early diagnosis of breast cancer.¹³ In the present study we observed that benign lesions were the most frequent accounting for 77.3% cases followed by malignant lesions in 9.1% of cases. Similar findings were observed by Bajwa et al.¹³

The most common benign lesion (C2) in our study was fibroadenoma 42.27% (104/246) followed by fibrocystic disease 33.7% (83/246). Fibroadenoma was also the most common lesion observed in the study by Chandanwale et al² 49% (49/100) and Echezoh et al¹⁴ 45% (45/100).

26 / 318 aspirates were categorized as gray zone lesions, 11/318 (3.4%) showed epithelial hyperplasia with atypia (C3) and 15/318 (4.7%) were reported as suspicious of malignancy (C4). Histological correlation in borderline lesions was available in 11/26 cases. 3/4 cases of C3 category were consistent with diagnosis of atypical epitheliosis and 6/7 cases were consistent with malignancy.

Our percentage of C3 was in between percentage reported by Challa et al,¹⁵ and Sankaya and Dongre¹⁶ who reported it to be 3.3% and 3.6% whereas percentage of C4 was comparable to Sankya and Dongre¹⁶ who reported it in 3.5% cases. According to Arul et al 2016¹⁷ diagnosis of C3 and C4 categories are difficult as they do

not have strict criteria for diagnosis.

In the present study, 9.12% (29/318) cases were diagnosed as malignant breast lesions. In a study conducted by Yalavarthi et al,¹⁸ 13.5% (45/334) cases were diagnosed as malignant.

In the present study cyto-histological correlation was available in 55 cases, showing that FNAC had 94.5% diagnostic accuracy, 87.5% sensitivity and 97.4% specificity of diagnosing various breast lesions.

The sensitivity ranging from 80-99.4% and specificity upto 100% have been reported the past.¹⁹⁻²²

Though FNAC is a reliable tool for diagnosis of breast lesions false negatives and false positives may occur. In the present study False negative was observed in (2/55, 3.6%) and false positive in one case i.e. 1.8%. The false negative and false positive have been reported ranging from 1.7% to 13.3% and 0.6% to 6.5% respectively in the past.²³⁻²⁹

Inadequate aspirates reported in the past ranged from 8-13.3%.³⁰⁻³³ Inadequate smears in the present study were 5.35%. Our observations were lower as compared to other studies this could be due to less number of cases in the present study. As histological correlation was not available in these cases, the possibility of malignancy cannot be excluded. NHSBSP⁷ surveys highlights that further clinical correlation and diagnostic modalities should be used in all cases with inadequate aspirates before considering them benign.

Conclusion

FNAC is a safe, cost effective outpatient procedure useful in early diagnosis and management of breast lesions and at times obviating the need of surgery. In the present study most of the non neoplastic inflammatory and benign lesions were managed conservatively.

We observed a high sensitivity and specificity for diagnosis of malignant lesions with minimal false negatives and false positives. In cases with discrepancy further clinical, laboratory and radiological correlation should be sought. Borderline (gray zone) lesions should be followed up.

Ethical Clearance- Taken from institutional ethical committee.

Conflict of Interest- None

Source of Funding- Nil

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Invitro Study to Assess the Impact of Chelating Agents on Microhardness of Primary Radicular Dentin

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Abstract

Background: To evaluate the effect of two irrigating solutions on microhardness of radicular dentin of primary teeth.

Methods: 10 buccolingual sections of roots of decoronated primary teeth were mounted in plaster, randomly divided into two groups of 5 specimens each according to the irrigant used: group1 (5.25% sodium hypochlorite with 17% EDTA) and group 2 (2-6% citric acid). Dentin microhardness was measured before and after irrigation at apical, middle, cervical levels of the roots with a Vickers indenter.

Results: There was a statistically significant difference in the microhardness values of radicular dentine before and after irrigation with both the agents. More reduction was seen with Citirc acid as compared to EDTA with statistically significant difference (p=0.001).

Conclusion: Chelating agent when used as irrigants bring about a significant reduction in microhardness of radicular dentine in primary teeth.

Keywords: Citric Acid, EDTA, Hardness test, Smear Layer

Introduction

Smear layer is a dense coating of residues obliterating the dentinal tubules, produced as a result of instrumentation.^(1,2) Removal of this smear layer can be done with the use of chelating agents. Although they improve the quality of obturation but, they may have the disadvantage of significant reduction of microhardness in primary root canals. The present study was conducted to evaluate the effect of two chelating agents namely, 5.25 % sodium hypochlorite with 17% EDTA and 6 % Citric acid used as irrigating solutions, on microhardness of radicular dentin in primary teeth.

Materials and Method

The study was carried out in the Department of OMR after approval by the Institutional Ethical Committee. 10 freshly extracted human primary teeth (anterior and posterior) that were indicated for extraction, having atleast one root with 2/3rd root length were selected for the study. The teeth were decoronated at the cemento enamel junction and the roots were sectioned buccolingually. These root halves were then embedded in blocks of plaster of Paris with the dentin facing upwards. The specimens were divided into 2 groups on the basis of the irrigant used i.e. Group I (5.25% sodium hypochlorite and 17% EDTA) and Group II (6 % citric acid).

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For every specimen three separate indentations were made at the cervical, middle, and apical levels of the root with a Vickers diamond indenter using a 200g load and a 10s dwell time. Microhardness value was obtained pretreatment which gave the mean baseline Vicker hardness number (VHN). The specimens were then

irrigated according to their respective groups. Group I- Continuous application of 17% EDTA & 5.25 % sodium hypochlorite was done for 3 minutes on each specimen. Group II – The individual specimens were treated with 6 % citric acid for 3 minutes.

Specimens were rinsed in distilled water after application of the irrigant and blotted dry. Vickers hardness number was again recorded post treatment and the change in microhardness was calculated.

Statistical Analysis

The data was analysed using SPSS software version 24.

Results

The mean baseline Vickers microhardness value for primary radicular dentin was found to be 51.69 ± 11.14 and 50.49 ± 15.85 VHN, in Group I and II respectively. Post-treatment mean VHN value was 33.28 ± 6.87 and 24.65 ± 6.39 in Group I and II respectively. When pre and post-treatment value was compared statistically among group 1 and 2, it was found to be statistically significant. 6% Citric acid caused greater percentage reduction in dentin microhardness than 17 % EDTA used with 5.25 % sodium hypochlorite and the pairwise comparison showed this reduction to be significantly different (p -value <0.05) as shown in Table 1 .

Table 1: Comparison of the microhardness between the two groups

Groups	Pre-Treatment (Mean \pm SD)	Post-Treatment (Mean \pm SD)	P-value*
Group 1	51.69 \pm 11.14	33.28 \pm 6.87	<0.01
Group 2	50.49 \pm 15.85	24.65 \pm 6.39	<0.01
p-value**	0.76	0.004	

*paired t-test applied, ** independent t-test applied

Discussion

Use of irrigating solution is an essential part of endodontic treatment. It renders the canals sterile, lubricates them for easy passage of files and removes the smear layer. It has been observed that a heavy smear layer is usually seen in the specimen's irrigated with saline solution alone. It produces a sludge layer made up of residual debris that cause occlusion of the dentinal tubules.⁽³⁾ Thus the use of chelating agents is recommended for removal of smear layer.

17 % EDTA as a final rinse in primary teeth for 3 minutes was found by Torabinejad VS to efficiently remove the smear layer from root canal walls.⁽⁴⁾ Sodium hypochlorite, in a 5.25% concentration, is antimicrobial, effective solvent of necrotic tissue, helps debride the root canals, and is nontoxic to the periapical tissues.⁽⁵⁾ Gotze GDR et al in 2005 found the effect of sodium hypochlorite and citric acid (CA) association in

removing smear layer (SL) of primary teeth. They stated that the efficacy of these auxiliary chemical substances was that they allowed better penetration and adaptation of the filling material to the root canals and helps in better disinfection of root canals.⁽⁶⁾

6 % Citric acid is a powerful antimicrobial agent and has been quite effective in removal of the smear layer. Salama FS et al in 1994 observed that 6% citric acid for 15 or 30 sec is quite effective in removing all the components of the smear layer of the root canals of the primary teeth and has recommended the use of 6% citric acid as an effective irrigant for smear layer removal in primary teeth.⁽³⁾ Though 6% concentration of Citric acid is considered as a weak concentration for chelating action but sufficient for removal of smear layer in primary teeth. Yet, in the present study significant reduction in microhardness was seen.

Hariharan et al showed that EDTA when used as a root canal irrigant in primary teeth, removed the smear layer but adversely affected the dentinal tubules through the conjugation of tubules, erosion of peritubular dentin and break down of intertubular dentin.⁽²⁾ The use of these agents on permanent teeth is advantageous although similar effects on primary teeth may be undesirable as they have a much reduced radicular dentin thickness. The average thickness of dentin in primary teeth is 0.52+0.24 Gpa.⁽⁷⁾

Chelating agents are preferably used in the permanent teeth for their advantage of smear layer removal but their effect on primary radicular dentin may be detrimental as they decrease its microhardness, ultimately decreasing the strength and affecting the mechanical properties of the tooth.

It can be assumed that reduction in microhardness might lead to faster resorption of roots, thus causing earlier exfoliation of primary teeth. It is thus recommended that additional studies should be conducted on finding the outcome and long term effect of these irrigants.

Conclusion

A significant reduction in the microhardness was seen on using 17% EDTA & 5.25% sodium hypochlorite and citric acid as root canal irrigants when compared with pretreated radicular dentin.

6% Citric acid produced greater reduction in microhardness as compared to 17% EDTA and 5.25% sodium hypochlorite and the results so obtained were statistically significant.

Ethical Clearance: Radiology, Indira Gandhi Government Dental College

Source of Funding: Self

Conflict of Interest: Nil

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A Study to Compare the Effect of Respiratory Muscle Stretch Gymnastic (RMSG) and Diaphragmatic Breathing on Pulmonary Function Test among Geriatric Population– An Interventional Study

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Abstract

Introduction : Aging is the universal phenomenon, India is the Second Largest country in the world with 72 million elderly person in 2011. It is suspected that it will be 172 millions by 2031. People above the age of 60 years are consider as Geriatric. Aging is associated with decrease in lung compliance and Thoracic Mobility. Kyphotic curvature of spine occurs due to aging, which increases AP diameter of the thorax. Increase in AP diameter of thorax alters the curvature & optimal length of Diaphragm and decreases its force generation capacity. Also due to poor posture Shoulder Quadrant muscle undergoes Shortening due to which pump handle and bucket handle movement do not occur properly, ultimately reducing the Thoracic Mobility & Flexibility. So there is a need to improve Pulmonary function among Geriatric Population.

Aim : To compare the effect of respiratory muscle stretch gymnastic (RMSG) and diaphragmatic breathing on pulmonary function test among geriatric population

Objectives : (1) To find out the effect of RMSG on FEV1, FVC and FEV1/FVC ratio in geriatric population

(2) To find out the effect of diaphragmatic breathing on FEV1, FVC and FEV1/FVC ratio in geriatric population

(3) To compare the effect of RMSG & diaphragmatic breathing on FEV1, FVC and FEV1/FVC ratio in geriatric population.

Method: Subjects who fulfil exclusion and inclusion criteria were selected by purposive sampling and were assigned to group A and group B by simple random sampling. They were explained about the study, its usefulness and written consent were taken. 60 subjects were divide into two Groups: Group A: 30 subjects were given RMSG Group B: 30 subjects were given Diaphragmatic Breathing.

Results: Data were analyzed using software SPSS version 20. Paired t-test was applied within the group and Unpaired t-test was applied between the two groups. Pre-treatment and post-treatment FVC, FEV1 and FEV1/FVC ratio was analyzed, it showed statistically significant (P value < 0.05) difference in both the group but when comparison was done between two groups, it was statistically non-significant (P value > 0.05).

Conclusion: Respiratory Muscle Stretch Gymnastic and Diaphragmatic breathing both were effective in improving pulmonary functions in geriatric population after performing breathing techniques for consecutive 3 days (once a day). But there was no significant difference between the two Groups in improving pulmonary function in geriatric population.

Key words: FVC, FEV1, FEV1/FVC ratio, geriatric population, RMSG

Introduction

According to census 2011 - India is the second largest country in the World with 72 million elderly person. People above 65 years of age are considered as Geriatric. Aging leads to: Loss Of Elastic Recoil of lung, Hyperinflation, Increases in Residual Volume, Alteration in Optimal Length of Diaphragm, Decreases Strength Of Respiratory Muscle.^{1,2}

Kyphotic curvature of the spine increases with Age which increases AP Diameter of thorax & Shoulder Quadrant muscle undergoes Shortening due to which Pump Handle & Bucket Handle Movement do not Occur Properly ultimately reduces thoracic Mobility.^{2,3}

RMSG Includes 5 Technique :⁴

1. Elevating & Pulling Back the Shoulder
2. Stretching the Upper Chest
3. Stretching the Lower Chest
4. Stretching the Back Muscle
5. Elevating Elbow

Diaphragmatic Breathing is a technique in which patient was asked to breath by the optimal use of Diaphragm.^{4,5} It involves Slow & Rhythmic Breathing. Pulmonary Function Test in form of FVC FEV1 & FEV1/FVC ratio was taken as an outcome Measure. ^{5,6,7}

Till now various respiratory techniques are used to improve pulmonary function among Geriatric but no study have been found which shows the effect of RMSG on Pulmonary functions among Geriatric Population. So the Need of the Study was to find out whether RMSG was effective in Improving pulmonary functions among Geriatric Population and than to Compare it's effect with Diaphragmatic breathing among geriatric population

Aims and Objectives

- To Find Out the Effect of RMSG on FVC, FEV1 and FEV1/FVC ratio among Geriatric Population.
- To Find Out the Effect of Diaphragmatic Breathing on FVC, FEV1 and FEV1/FVC ratio among Geriatric Population.
- To Compare the Effect of RMSG and

Diaphragmatic breathing on FVC, FEV1 and FEV1/FVC ratio among Geriatric Population.

HYPOTHESIS

H₀- There is no significant difference between the Effect of RMSG and Diaphragmatic breathing on FVC, FEV1 and FEV1/FVC ratio among Geriatric Population.

H₁- There is a significant difference between the Effect of RMSG and Diaphragmatic breathing on FVC, FEV1 and FEV1/FVC ratio among Geriatric Population

Methodology

- Research Design: Comparative Interventional Study

- Sample Size: 60 Subjects

- Sample Source: Rajkot- Gujarat-India

- Inclusion Criteria:

Age: Subjects > 65 years

Gender: Both Male and Female

Subjects who understands & follow the command

- Exclusion Criteria:

Subjects doing meditation or yoga or exercise on regular basis.

Subjects with the history of smoking.

Subjects with neurological, Cardiorespiratory or Musculoskeletal disorders related to

spine which may affect respiratory mechanics.

Uncooperative Subjects & Subjects who denied for Participation.

- Instrumentations:

- o Instruments and Tool used:

- § Spirometer (Helios 401)

- § Pen

- § Paper

- § Data Collection Sheet

- § Consent Form
- § Towel
- § Cotton
- § Spirit
- § Mouthpiece
- § Nose clip
- § Plinth
- § Pillow
- § Stopwatch

PROCEDURE

Subjects those who fulfill the study's inclusive and exclusive criteria and give their consent form were included in the study. Prior to testing, the subjects were familiarized with the testing procedure.

Subjects were divided into 2 Group Group A was Given RMSG & Group B was Given Diaphragmatic Breathing. Pre & Post Pulmonary Function Test was taken as per the standard guideline of American Thoracic Society.

PFT (Pulmonary Function Test- FVC, FEV1, FEV1/FVC) measurement procedure:⁷

- Pre and post pulmonary function test was taken as per the standard outlined by American Thoracic Society. Subjects were given comfortable position on table without back support and foot resting on the floor, a soft nose clip was placed to prevent air escaping from nose and test was performed.

- For measurement of FEV1, FVC and FEV1/FVC ratio, patients were asked to take the deepest breath as much as possible than place the mouthpiece in mouth with lips sealing it and immediately exhale hard and fast for as long as possible, preferably atleast 6 seconds followed by a rapid inspiration from the mouthpiece.

- Three trials were given for each procedure and best trial was selected. The trial was considered "unacceptable" if it showed evidence of cough, early termination of expiration or inconsistent effort.

After collection of data, pre and post value for FEV1, FVC and FEV1/FVC were analyzed by statistical software and results were found.

Group A was given RMSG Technique: ⁴

RMSG Includes 5 Technique :

1. Elevating & Pulling Back the Shoulder
2. Stretching the Upper Chest
3. Stretching the Lower Chest
4. Stretching the Back Muscle
5. Elevating Elbow

These breathing techniques was given for 7 consecutive days (once a day).

Group B was given Diaphragmatic Breathing Technique: ^{5,6}

- Subjects were ask to sit in semi fowler's position.

- They were told to place their hand below the anterior costal margin and feel the movement occurring. Then the subjects were told to breathe in slowly and deeply through the nose allowing the abdomen to rise slightly and then relax and exhale slowly through the mouth.

- These breathing technique was performed for continuous 5 minutes such that patient takes 6 to 8 deep breath per minute.

- These breathing technique was given for 7 consecutive days (once a day).

Result

Statistical Analysis

Study design: Comparative study.

Statistical software: The statistical software named SPSS 20.00 was used for data analysis. Microsoft Excel and Word were used to generate graphs and tables.

Test: The normality of data was checked by using Shapiro-Wilk test which shows data was of parametric type. Comparison between with groups was done by

unpaired t-test.

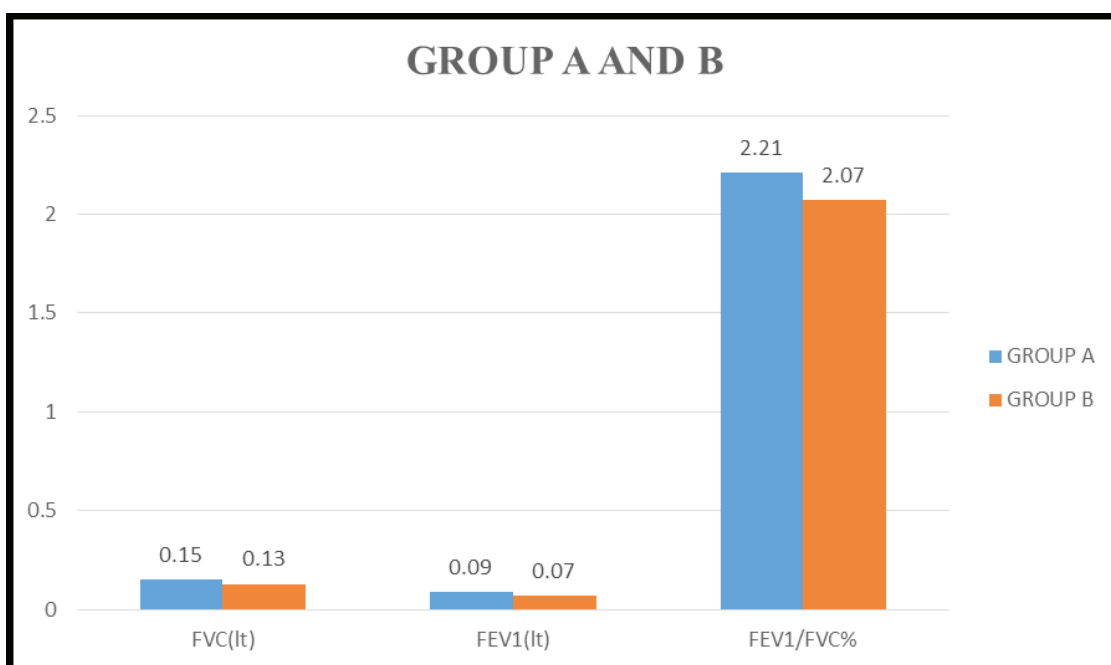
Level of significance (p value) was set to 0.05

Table 1 Intra group comparison of FVC, FEV1 and FEV1/FVC ratio for GROUP A- RMSG.

Parameters	Mean ± Std. Deviation		t	p	Result
	Pre	Post			
FVC(l)	1.89 + 0.29	2.18 + 0.30	-4.993	<0.05	Significant
FEV1(l)	1.70 + 0.28	1.87 + 0.24	-2.863	<0.05	Significant
FEV1/ FVC (%)	88.15 + 6.16	88.90 + 4.73	-1.492	>0.05	Non-Significant

Table 2 Intra group comparison of FVC, FEV1 and FEV1/FVC for GROUP B– Diaphragmatic Breathing.

Parameters	Mean ± Std. Deviation		t	p	Result
	Pre	Post			
FVC(l)	2.08 + 0.34	2.27 + 0.34	-4.271	<0.05	Significant
FEV1(l)	1.91 + 0.27	1.98 + 0.26	-4.572	<0.05	Significant
FEV1/FVC (%)	88.71 + 5.02	88.73 + 4.45	-2.028	>0.05	Non- Significant



Graph 1 Comparison of mean difference of FVC, FEV1 and FEV1/FVC ratio between Group A and Group B.



Figure 1 Patient Performing RMSG Exercises

Discussion

The result of these study supports the null hypothesis. In group-A significant difference was found in pre & post FVC and FEV1 but no significant difference was found in pre and post FEV1/FVC ratio. In group B significant difference was found in pre & post FVC and FEV1 but no significant difference was found in pre and post FEV1/FVC ratio. Inter Group comparison of Group A and Group B suggested that there was no significant difference for FVC, FEV1 and FEV1/FVC ratio between the two Groups.

RMSG is based on theory of Lapasle's law – Ventilation of Lung depends upon the Length of Respiratory muscle. Maximal Force is Generated by the respiratory muscle when they are in their Optimal Length. As Geriatric have alteration in the Optimal length of respiratory muscle (Diaphragm & Intercostal muscle).^{3,13}

When RMSG is given Muscle Spindle Stimulates & Sends Signals to Alpha motor Neuron, as a result of

which Extradfusil fiber of Muscle Spindle Contracts. The more the muscle contracts, the more it will relax according to the frank starling law. Hence by Giving RMSG, Optimal Length of the respiratory Muscle can be reached.¹³

Nidhi ved et al stated that RMSG have beneficial effect on pulmonary function among Menstruating women when RMSG was given for consecutive 3 days(Once a day).

Some studies suggested that diaphragmatic breathing increases the lung compliance and reduces the airway resistance. The reason behind it is believed that during diaphragmatic breathing the maximum deflation of lungs occurs, which is an important physiological stimulus for the release of surfactant and prostaglandin into the alveolar spaces, surfactant reduces the surface tension and improves the lung compliance, allowing the lung to inflate more easily and reduces the airway resistance.⁸

According to **Sheetal Panwar et al and Prem kumar yadav et al** during diaphragmatic breathing pulmonary pressure continues to rise due to increase in venous return to the heart, these increase in pulmonary pressure may provide an adequate driving force to propel the blood to the upper most part of the lung where ventilation of the air is more, this results in more perfusion from top to bottom and improves ventilation perfusion ratio.^{8,9}

The present study show statistically significant results for Diaphragmatic breathing exercise, supporting to these **Kyochul Seo et al** stated that there was a significant increase in tidal volume, inspiratory capacity, inspiratory reserve volume and breathing capacity in experimental group (Diaphragmatic group) than the control group after performing 30mins session for 3 times a week for 4 week in male smokers.¹⁰ **Karina m et al** demonstrated that Diaphragmatic breathing shows positive result in improving lung volumes, respiratory motion, SPO2 and also in reducing respiratory rate among both COPD and Healthy individual while Pilate breathing do not show any changes among COPD but improves lung volume and SPO2 among healthy individual.¹²

In harmony with the result of present study **Prem Kumar Yadav et al** suggested that diaphragmatic breathing significantly increases FVC, FEV₁, PEFR, MVV, FEV₁/FVC ratio and TV in 50 healthy adults who performed diaphragmatic breathing exercise for 3 months. However, FEV₁/FVC ratio was more significant in male than female while FVC was more significant in female.⁸

Conclusion

Respiratory Muscle Stretch Gymnastic & Diaphragmatic Breathing both were effective in Pulmonary function test among geriatric Population. But there was no significant difference between two groups after performing breathing technique for consecutive 7 days among geriatric Population.

Clinical relevance

Results suggest that both the techniques i.e. Respiratory Muscle Stretch Gymnastic and Diaphragmatic breathing showed statistical significant

difference in pulmonary functions after performing breathing technique for consecutive 7 days among geriatric Population. Hence both the technique can be alternatively used as an adjunct with other techniques for improving pulmonary functions in individual who have reduce lung volumes and capacities.

Limitation

- Blinding was not done in the study.
- Sample size was relatively small.
- Study duration of the treatment protocol was short

Further recommendations

- Study can be done with large sample size.
- Treatment can be given for longer duration with follow up.
- Other pulmonary function parameters and outcome measures like PEFR, Chest expansion can be used.
- Different populations who have reduced lung volume and capacities can be studied.
- Study can be done with control group.
- Blinding could be done in future study.

Source of Funding – self

Conflict of Interest - Nil

Ethical Clearance – was taken at K K Sheth Physiotherapy College.

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The Effect of X Box 360 Kinect-Virtual Reality Intervention on Balance and Gait Training In Stroke Patient”: An Interventional Study

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Abstract

Background: Kinect- based Virtual Reality training that includes auditory and visual stimulation, feedback information, repetitions of the same motion that performing rehabilitation exercises. **Aim:** To Evaluate the effect of XBOX 360 Kinect-Virtual Reality training on balance and gait in patient with chronic stroke. **Methodology:** Consent was taken from all 30 subjects for participating in the study. Baseline measurements berg balance scale, 6 min walk test and gait parameters will be taken. Patients randomly have divided into 2 groups. Group A: conventional PT (n=15) 60 min and Group B: conventional PT with Virtual reality XBOX 360 Kinect (n=15) 60 min. After they will be assessed for post outcome measures. **Conclusion:** there is conclude that virtual reality X box 360 with physical therapy is more effective then only physical therapy for improve balance and gait in chronic stroke patients.

Key Words: Stroke- balance and gait activity -XBOX 360-Virtual reality.

Introduction

Stroke, is the second largest cause of death and a major cause of disability & handicap. ^(10,11) In people recovery of functional ability after stroke is variable and between 30 – 60% of people remain dependent on other for some activities of daily living. ⁽⁵⁾ Key functional task such as ability to walk has been identified by patient as being of great significance. Approximately 50 – 80% of patient will regain some degree of walking ability after stroke. ⁽⁹⁾

VR is an advanced technology that can display 3D visual images that change rapidly in response to instruction from the user which appears to provide an answer to this challenge due to its well-known assets including opportunity for experiential active learning,

the ability to objectively measure behavior in challenging but safe and ecologically valid environments, while gradually increasing the complexity of task and decrease the support provided by clinicians ⁽¹⁾. A number of researchers have integrated VR into assessment & rehabilitation of cognitive process, such as visual perception & executive function, and into training of activities of daily living.

One key benefit is VR’s more naturalistic or “real – life” environments. ⁽¹¹⁾ The environment is usually referred as being ‘Immersive’ in which user has a strong “sense of presence” by using video capture system where the user view them self or an avatar in the scene. In a Non Immersive VR the user interacts with degrees with environment. In addition, VR can be tailored according to the need of the client ⁽¹⁾

VR-based systems that use sensor technology to monitor whole-body movements can elicit patients to perform high-intensity and high-energy movements. Kinect- based systems (Microsoft Corp, Redmond, WA) reduce the demand on staff time for intervention and increase patients’ motivation toward rehabilitation.

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Kinect- based VR training that includes auditory and visual stimulation, feedback information about “winning” or “losing,” and repetitions of the same motion can provide a variable rehabilitation tool that reduces barriers to individuals performing rehabilitation exercises.⁽¹⁾

The most recently released Xbox Kinect system has an RGB camera and a dual infrared depth sensor for the automatic detection of limb and body position and motion. The system uses these elements to capture data to create a 3-dimensional human body model in real time, called an avatar, which allows for patient to use their own body as the controls to play a game. The reliable visual feedback from the on-screen player’s avatar may provide accurate feedback on movement⁽¹⁾.

Although the Kinect gaming system has been shown to be of therapeutic benefit in rehabilitation, the applicability of Kinect-based VR training to improve motor function in patients following the occurrence of a stroke has not been evaluated.⁽¹⁾

Methodology

- **Study type:** Interventional Study
- **Study setting:** Rajkot city
- **Sample size:** 30
- **Study duration:** 6 weeks.

CRITERIA FOR SELECTION

Inclusion Criteria:

- Age: 40 – 60 years.
- Gender: male and female
- Chronic stroke patient: more than 6 months
- Could walk independently or with a guide (with or without an assistive device) for 10 m.
- With a MMSE rating >24.

Exclusion Criteria:

- Uncooperative patient.
- Subjects with any progressive, critical or long term illness, an unstable cardiovascular, musculoskeletal

or neurological condition, demonstrate inability to follow instructions.

Procedure

- 30 subjects were selected as per selection criteria.
- Then Informed consent obtained from the patients.
- Patient randomly divided into group A and group B.
- Group A - conventional Physical Therapy with Virtual reality XBOX 360 Kinect^(1,3,4). (n = 15)
- Group B - conventional Physical Therapy⁽¹⁾. (n = 15)

GROUP A

Patients was exposed to two software for XBOX 360 kinect.

1. Kinect Sports.

Kinect Sports consists of 6 sports, including Bowling, Boxing, Track and field, Table tennis, Volleyball and Soccer (football). Players can also play improving mini-games. The game includes interactive cut scenes, music that plays in replays and highlights while playing the sports.

2. Kinect Adventure:

Kinect Adventures uses full body motion to allow the player to engage in a variety of mini games, all of which feature jump-in, jump-out multiplayer play. Each mini game lasts about three minutes. While most of the mini games are co-operative in two player mode, Reflex Ridge is a competitive game. The object of all the mini games is to get the highest number of adventure pins, which are collected in different ways.

GROUP B

ROM exercises, Balance training, Gait training: 3 days per week, 60 min

Outcome measures

Berg Balance Scale.

6 Min Walk Test.

Gait parameters - step length, stride length, cadence

Pre intervention, baseline characters BBS, 6 min walk test, gait parameters of both groups were matched using statistical tests.

Results

The effect of Virtual reality using XBOX 360 Kinect on postural control and gait calculated and entered in MS-EXCEL. It analyzed and graphs were made in MS-EXCEL sheets. Before beginning with analysis,

The data was analyzed in SPSS version 21.0 windows was used for the statistical analysis. Accordingly, paired t test was used for Intra group analysis for 6 min walk test and gait parameters and Wilcoxon test for BBS and Unpaired t Test for Inter group analysis and p-value less than 0.05 were considered statistically significant.

Table 1 GROUP A INTRA GROUP ANALYSIS

Outcome Measure	Pre Mean	Post Mean	PRE Standard Deviation	POST Standard Deviation	P-value
BBS	43.73	50.13	4.11	3.70	0.000
6 MWT	53.06	62.53	4.46	4.73	
STEP LENGTH	43.86	59.53	5.39	8.36	
STRIDE LENGTH	85.33	108.13	10.54	14.62	
CADENCE	87.2	102.46	10.54	10.94	

Intra group analysis of group A in Table 1 suggest that there is significant difference in all the outcomes after 6 weeks of Virtual reality X box 360 and conventional therapy.

Table 2 GROUP B INTRA GROUP ANALYSIS

Outcome Measure	Pre Mean	Post Mean	PRE Standard Deviation	POST Standard Deviation	P-value
BBS	44.06	48.6	4.19	3.35	0.000
6 MWT	52.8	59.26	3.25	3.55	
STEP LENGTH	44	55.53	3.56	5.12	
TRIDE LENGTH	82	91.13	6.33	6.05	
CADENCE	87.46	95.8	8.83	7.60	

Intra group analysis of group B in Table 2 suggest that there is significant difference in all the outcomes after 6 weeks of conventional therapy.

Table 3 INTER GROUP ANALYSIS

Outcome Measure	Group A Mean	Group B Mean	Group A Standard Deviation	Group B Standard Deviation	T value	P-value
BBS	50.13	48.60	1.29	1.40	3.77	0.001
6 MWT	62.53	59.26	2.38	2.92	3.07	0.005
STEP LENGTH	59.53	55.53	3.81	3.04	3.28	0.003
STRIDE LENGTH	108.13	91.13	10.01	3.70	4.95	0.000
CADENCE	102.46	95.80	3.90	3.67	5.01	0.000

Inter group analysis in table 3 suggest that group A shown significant improvement than group B. There is more significant improvement in balance and gait in patients with chronic stroke.

However, for the BBS, 6 min walk test and gait parameters the intervention group demonstrated significant improvement as compared with the control group.

Discussion

In the result of the study, group A - shows more significant difference than group B. Previous studies have reported improved upper extremity function in patients with stroke following use of VR gaming systems. ⁽¹⁾ **Hsin-Chieh Lee** suggested, VR balance training by using Kinect for Xbox games plus the traditional method had positive effects on the balance ability of patients with chronic stroke. The VR group experienced higher pleasure than the ST group during the intervention. ⁽²⁾ **Pohl**, concluded that the stroke related impairments are powerful modifiers of performance in a 6-minute walk test. Motor deficits of lower limb and decrease balance contribute to the distance travelled by an adult in 6 minutes. ⁽⁶⁾ **Albert de Graaf** investigated

the in-depth research as there have been several motion tracking devices introduced by gaming industry, like **Nintendo Wii**, PlayStation 3 eye and Microsoft XBOX 360 Kinect & if these techniques can be used for home based upper extremity rehabilitation. The results are promising and test results show that the techniques meet the requirements and already proved to help in rehabilitation.⁽⁷⁾ VR training may have contributed to the improvements in balance and gait function observed in the participants by encouraging more interest, concentration on the task, fast response, repetition of exercise, motivation for patients, provide feed to patients during exercise and other side alternative to programs of repetitious exercise that are often performed in front of a mirror that can provide low intrinsic motivation^(1,2) In the present study, a combination of 2 games (the Kinect Sports and the Kinect adventure) was used for stroke patients. The programs required active movements, and the participants usually performed the active movements of the hip, knee, or ankle, as well as the lower extremity. There measure BBS, 6 min walk test and gait parameters scores. That the VR had a positive effect on improving participation in balance and gait. Group B had 15 patients performing conventional physiotherapy in this ROM, Balance training in weight bearing and weight

shifting exercises weight bearing with reach out, and in Gait training walking forward, backward, sidewalk, obstacle walk. Which all exercises are done in VR with feedback and in form of game so patient become motivation and feedback and also they also like to do exercise with game.

Balance and gait is improved in virtual reality group reason could be Virtual reality training is given in simulated environment providing visual input like subject can recognize their body on screen through Kinect and can move body part in order to play different games, auditory input were also provided, subjects were instructed for each game and continuous live feedback of their progress are provided through speakers, they were appreciated for their gains in every move, Somatosensory feedback is also provided to subjects by keeping hand on patients paretic arm to move it in right direction and also through trunk belt which gives feedback for, appropriate movements in different directions which work on proper dissociation of trunk during game. Therefore, all three components necessary to improve balance are provided in VR technique. Which shows significant improvement in balance post visual feedback, the structure of the brain can be enhanced using visual feedback in virtual reality to augment interconnected, distributed cortical regions. It is suggested that visual information can provide a potent signal for the reorganization of sensorimotor circuits. Subjects therefore performed well in order to win every game which improves their balance automatically, equally they were appreciated for their every gain that boosted their confidence and they performed well in every next session.

In group A there was significant improvement in BBS score, 6 min walk test and step length, stride length, cadence. There was more improvement in VR training with convention in stroke patients in balance and gait. So null hypothesis is rejected. There was not any effect on balance and gait in stroke patients by Virtual Reality intervention through XBOX-360 Kinect that was null hypothesis which was rejected. Virtual reality very useful for motor learning and rehabilitation program. Therefore, Virtual reality using x box 360 Kinect can be used as one of the best therapy for rehabilitation program.

Further recommendation:

Study can be done to know effect of Virtual reality Xbox 360 exercise in patients with Parkinsonism or other neurological disorders.

Conclusion

Virtual reality training using X box 360 Kinect as effective therapeutic approach for improving balance and gait in stroke patients in rehabilitation. Their level of experienced by VR group was higher than conventional physical therapy group. So there is conclude that virtual reality X box 360 with physical therapy is more effective then only physical therapy for improve balance and gait in chronic stroke patient.

Source of Funding: Self

Conflict of Interest: Nil

CTRI No: CTRI/2019/10/021499

Ethical Clearance: Ethics Committee, RK University.

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A Study to Correlate the Vertical Jump Test and Wingate Cycle Test as a Method to Assess Anaerobic Power in Football Players

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Abstract

Background and Objectives: Anaerobic energy production is extremely important in football as it provides energy at a very high rate during periods of intense activity in a match. The Wingate cycle ergometer test and vertical jump tests have been used to assess anaerobic power in athletes for the purpose of providing vital information regarding anaerobic performance of athletes for given sports. The objective was to correlate vertical jump test with Wingate anaerobic test as a method to assess anaerobic power in football players.

Method: 100 football athletes with mean age of 17.18 +1.95 (SD) years were selected. Anthropometric measurements, the vertical jump test and Wingate cycle ergometer test were performed. Peak and mean anaerobic power were determined.

Results: Data were analyzed by using SPSS software 14.00 by Pearson Correlation coefficient which showed significant moderately positive correlation between peak power ($r = 0.220$, $p < 0.05$) & mean power ($r = 0.263$, $p < 0.05$) of vertical jump test and Wingate test.

Conclusion: The result suggested that vertical jump tests can be accept as field measures of anaerobic power instead of laboratory-based Wingate anaerobic test in football players.

Key words: Vertical jump test, Wingate Anaerobic test, Anaerobic peak and mean power, football players.

Introduction

Physical and physiological characteristics of football players required high level of anaerobic power, aerobic capacity, speed, muscular strength, agility and flexibility.¹ During a 90-minute game, elite-level players run about 10 km at an average intensity close to the anaerobic threshold (80–90% of maximal heart rate). Within this endurance context, numerous explosive bursts of activities are required, including jumping, kicking, tackling, turning, sprinting and changing pace and sustaining forceful contractions to maintain balance and control of the ball against defensive pressure.²

Anaerobic energy production is extremely important in football as it provides energy at a very high rate during periods of intense exercise in a match. The concentration

of lactate in the blood is frequently used as an indicator of anaerobic energy production in football.³

The Wingate anaerobic test (WAnT) and vertical jump tests have been commonly used tests to assess anaerobic power in athletes for the purpose of providing vital information regarding anaerobic performance of athletes for various sports.⁴

Wingate Anaerobic Test has been used to assess anaerobic-fitness levels and the effectiveness of anaerobic-training programs for a variety of power sports including football, basketball, tennis, and track and field.⁵

Activities of this intensity and duration rely heavily on anaerobic metabolic pathways, namely the ATP-

PC pathway and the glycolytic pathway. Previous researchers indicated that, during a 30-second Wingate Anaerobic Test, the energy contribution of the ATP-PC pathway is 28%, of the glycolytic pathway is 56%, and of the aerobic pathway is only 16%. Due to the specificity of the Wingate Anaerobic Test for measuring components of anaerobic capacity, it would seem logical to use this test to measure anaerobic power.⁵

The vertical jump test is widely used as field tests for assessment of explosive strength of lower limbs in many sports. Such methods are frequently studied considering their confidence and validity in volleyball and football players.⁶

During a Vertical jump test; the aim of the performer is to attain maximum vertical displacement of the body's center of mass (i.e. vertical height) in each consecutive jump over a period of time. Since the vertical displacement during a jump is mainly dependent on the mechanical power output during the push-off phase, the measurement unit used to express Vertical jump test performance is mean power expressed in Watt, this can be easily estimated with the formula described by Harman's formula.⁷ Harman's formula is reliable and valid for calculation peak power and mean power for vertical jump test.⁸

Bosco et al. reported that the highest average power output during the Vertical jump test is achieved during the first 15s and then declines progressively until the termination of the test. Additionally, the average mechanical power output for the first 15s period has been found to be highly correlated ($r = 0.86$) with fast twitch muscle fiber distribution (FT), while the power output during the successive 15s periods demonstrated a lower correlation with FT (15-30s, $r = 0.72$). During a vertical jump test, power output required to attain maximal jump height and complete a single test is reached between one and two seconds which suggests that only the adenosine triphosphate- phosphocreatine (ATPPC) energy system is utilized since the test duration is so short.⁴

There are limited studies shows correlations of vertical jump test with Wingate anaerobic test to measure anaerobic power in football players. So, the need of study was to correlate vertical jump test with Wingate anaerobic test as a method to assess anaerobic power in football players.

Methodology

Source of data: Various schools, colleges and sports institute

Study design: Correlational study

Sampling technique: Simple convenient sampling

Sample size: 100 football players

Study duration: 2 days

Selection Criteria:

Inclusion Criteria:

- Age group: 14-20 years
- Healthy male football players.
- Athlete playing football more than 1 year for 5 times in a week.
- Football players participating in competitions at school, college or club levels.

Exclusion Criteria:

- History of any cardiovascular, musculoskeletal, neurological problem, metabolic disorder.
- Smoker or ex-smoker
- Athletes having history of Trauma
- Athletes with regular participation in any other athletic activity
- Uncooperative athletes

Materials to be used:

Cycle ergometer (monarck ergomedic 894E), Measure tape, Wall, Chalk stick.

Measurement Procedure:

The proposed title and procedure have been approved by ethical committee members. Football players from various school, colleges and sports institutions were screened and amongst them those who fulfilled inclusion and exclusion criteria were requested to participate in study. 100 subjects were selected from them by convenient sampling method. Procedure, potential risks

and benefits were explained in brief and written consent was taken from all.

Study duration was of 2 days for each participant.

Day 1:

Vertical Jump Test:

Prior to the vertical jump test, the athletes were led through an 8-10-minute warm-up. The athletes' tip of middle finger was marked by therapist. Athlete was asked to stand aside of the wall, keeping both feet remaining on the ground, reaches up as high as possible with one hand and marked the wall with the tips of the middle finger (M1). From a static position the athlete was asked to jumped as high as possible and mark the wall with the chalk on his finger (M2). The distance between M1 and M2 was measured and recorded by the therapist. The test was repeated 3 times. Best of three of recorded distances was considered and those values were used to assess the athlete's performance by using Harman Formula.

Harman et al (1991) established equations for peak and average power.⁸

Peak power (W) = $61.9 \times VJ \text{ (cm)} + 36.0 \times \text{mass (kg)} + 1822$

Average power (W) = $21.2 \times VJ \text{ (cm)} + 23.0 \times \text{mass (kg)} - 1393$

Day 2:

The Wingate Anaerobic test:

The Wingate anaerobic test was performed on a computerized Monarck Cycle ergometer (Monarck ergomedic 894E). The athletes were asked to perform a warm up for 10 minutes. To eliminate the possibility of fatigue after the warm up, a brief rest period followed by the warm-up before testing was given. The seat height was adjusted in such a way that so that no more than 5° of flexion was possible when the leg was fully extended.

The data for each subject were entered into the preinstalled Wingate Power software program. Prior to the initiation of the test, the pre-determined workload was placed in the ergometer's basket. The resistance was calculated as 7.50 % of the subject's body weight.

Each subject pedalled the cycle without resistance before test begun for 2 minutes to building up to maximal revolution per minute to overcome the initial inertia of the ergometer. Once the required pedalling speed as calculated was reached, the resistance was added instantaneously by automatic dropping of the weight rack by the machine.

Peak power and mean power were calculated and recorded in watts (W) using software power program.

Statistical Analysis

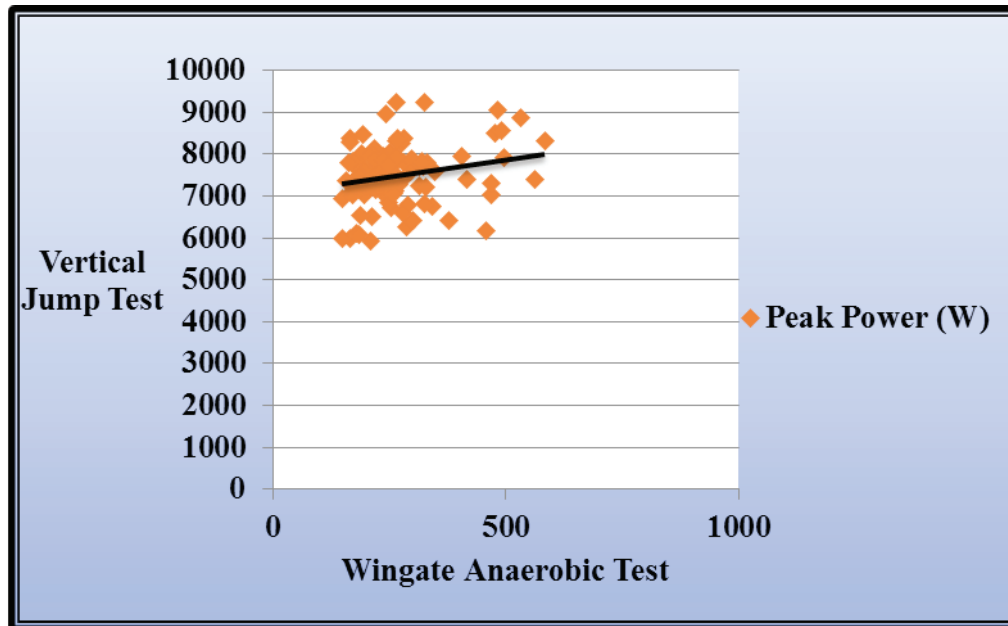
Statistical analysis was done by using SPSS 14 version for windows software. Pearson Correlation test were used to determine the degree of correlation between peak power and mean power of Vertical jump test and Wingate anaerobic test.

Results

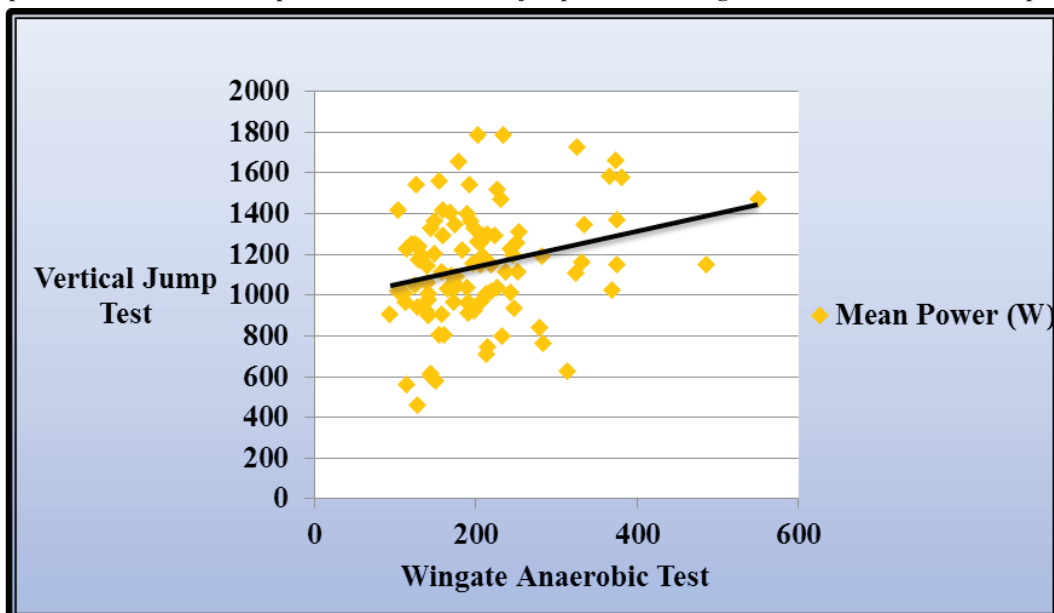
Table 1: Correlation of Peak power and mean power between vertical jump test and Wingate anaerobic test in football players

	N	Mean	SD	r value
WAnT peak power (W) [Pearson correlation sig.]	100	268.35	+97.14850	0.220 0.028
Vertical jump test peak power (W) [Pearson correlation sig.]	100	7492.67	+709.01990	
WAnT mean power (W) [Pearson correlation sig.]	100	205.5334	+82.66076	0.263 0.008
Vertical jump test mean power (W) [Pearson correlation sig.]	100	1141.6200	+274.70086	

Above table 1 shows correlation of peak and mean power between Wingate anaerobic test and vertical jump test. Mean value of peak power of Wingate anaerobic test is 268.35 (W) and that of vertical jump test is 7492.67 (W). Pearson correlation of peak power of vertical jump test with peak power of Wingate anaerobic test demonstrate a positive correlation ($r = 0.220$, $p < 0.05$) which shows moderately positively correlated. Mean value of mean power of Wingate anaerobic test is 205.5334(W) and that of vertical jump test is 1141.6200(W). Pearson correlation of mean power of vertical jump test with mean power of Wingate anaerobic test demonstrate a positive correlation ($r = 0.263$, $p < 0.05$) which shows moderately positively correlated.



Graph 1: Correlation of Peak power between vertical jump test with Wingate anaerobic test in football players



Graph 2: Correlation of mean power between vertical jump test and Wingate anaerobic test in football players

Discussion

The major finding of study was to correlate peak and mean power of vertical jump test with that of Wingate

anaerobic test. The result shows moderately positive correlation between peak power of vertical jump test with Wingate anaerobic test ($r = 0.220$, $p < 0.05$) and also shows moderately positive correlation between mean

power of vertical jump test and Wingate anaerobic test ($r = 0.263$, $p < 0.01$) there by supporting the experimental hypothesis. These findings demonstrate validity of vertical jump test as a field test as a measure to assess anaerobic power in football players.

Accurate anaerobic power assessment is paramount for athletes, as many sports involve rapid rest to high intensity exercise transitions such as sprinting and jumping movements. In addition, many team sports require participants to produce maximal or near maximal sprints of very short durations (e.g. 1–7 s). For example, majority of sprints performed during a soccer match are less than 20m in distance or approximating 3.5s to complete. The sudden release of large amounts of energy to produce such high intensity performances can be provided in main by non-mitochondrial energy pathways involving ATP–PCr degradation and glycolysis.¹⁰

Stauffer KA et al, was found a significant correlation ($r = 0.85$) between peak power measured during the Vertical Jump and Wingate anaerobic power tests, demonstrate validity of the Vertical Jump as a field test of anaerobic power. Both tests rely heavily on ATP/PC energy system contributions to produce/sustain maximal anaerobic power.¹⁰

According to **Beckenholdt et al.**, anaerobic tests should be performed specifically for skill or sport being tested, since a high degree of specificity has been found among various anaerobic tests. The VJT is more specific in sports where jumping ability and explosive power is mainly utilized because of its compatibility with the action of the muscle groups involved. However, although height was found to be significantly correlated with maximal power in units relative to body mass, the WAnT prevails as an indicator of the rate at which muscle power can be generated from the splitting of energy rich phosphagens and glycogenolysis because of its high reliability and validity in assessing anaerobic power.¹¹

Apostolos T. et al, confirmed the differences in mean power values (both absolute and relative to body mass) elicited during two tests, with the relative power values of the VJT being almost double than those recorded for the respective WAnT. Prior assessments of a 30s VJT and 30s WAnT reported mean relative power values of 18.3 ± 5.28 W.kg⁻¹ vs 6.86 ± 1.21 W.kg⁻¹ and 1258 ± 462

W vs 622 ± 167 W. **Hoffman et al.** measured power outputs of 43.3 ± 6.9 W.kg⁻¹ and 9.5 ± 1.0 W.kg⁻¹ for a 15s VJT and a 30s WAnT respectively.¹¹

Bosco et al. described this phenomenon to the stretch-shortening cycle (SSC) present throughout VJT. SSC is believed to allow muscles to store potential energy, thus resulting in power outputs considerably higher than the chemo-mechanical values. The output produced during the jumping test incorporates also the recovery of mechanical energy stored in the elastic elements of the lower limbs. The potential energy stored in muscles due to the eccentric action has a substantial effect in jumping exercises, but it is negligible in cycling, where the muscles are contracting primarily concentrically.¹¹

Second is, Newton's second law indicates that greater forces will result in greater accelerations. As acceleration increases the required forces also increase; therefore, achieving high velocities, power outputs, and jump heights is dependent upon high force production results in high anaerobic power.¹²

The differences between cycling vs. jumping modes of anaerobic power assessment may also relate to the significant differences observed in power outputs between the tests. By recruiting a greater muscle mass (both legs acting simultaneously and the inclusion of upper-body musculature), the jump test appeared to result in a significantly greater power expression. Moreover, the greater power outputs observed in the jump test may also be related to a greater recovery of mechanical energy that is stored in the elastic elements of the body during the countermovement.⁴

Moreover, it was also found that subjects with more height and or weight exhibited capacity to generate greater power outputs while performing VJT and WAnT. Height and weight used in present study for prediction equation for anaerobic power in VJT. This finding suggests positive correlation between height / weight and power output.¹⁰

The result of study showed that there was moderately positive correlation between peak and mean power of vertical jump test with Wingate anaerobic test. So, vertical jump test can be used as a field test instead of laboratory-based Wingate anaerobic test in football

players.

Limitations of study are small sample size, only male athletes and result cannot be generalized to all population because study age group is between 14-20 years.

Further recommendation will be correlation of vertical jump test with Wingate anaerobic test in other sports, both genders can be tested and different age group can be considered.

Conclusion

The present study concluded that vertical jump tests can be used as field measures of anaerobic power instead of laboratory-based Wingate anaerobic test in football players.

Acknowledgement

Authors acknowledge the immense help received from the all football players. The authors are also grateful to God and Parents.

List of Abbreviations

1. WAnT: Wingate anaerobic test
2. VJT: Vertical jump test
3. PP: Peak power
4. MP: Mean power
5. BMI: Body mass index
6. ATP: Adenosine Triphosphate
7. ATP PCR: Adenosine Triphosphate Phosphocreatine
8. W: Watt
9. Kg: Kilograms
10. Cm: Centimeters
11. S: Seconds

Conflict of Interest None

Source of Funding: None

Ethical Clearance : Ethical approval has been

taken.

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A study to Assess the Effectiveness of Jacobson's Progressive Relaxation Technique on Anxiety among Elderly People of Aged 60-70 Years in Selected Old Age Homes at New Delhi

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Abstract

Introduction: The elderly who are residing in the old age homes may have the chances of experiencing anxiety as they are away from their children and succumb to health problems. The purpose of the study was to reduce the anxiety among elderly by making them experience Jacobson's progressive muscle relaxation technique.

Objectives:

1. To assess the level of anxiety among elderly people aged 60- 70 years.
2. To assess the effectiveness of Jacobson's progressive relaxation technique on anxiety among elderly people aged 60-70 years.
3. To find out the association between anxiety and selected demographic variables among elderly people aged 60-70 years.

Materials and Method: A Quantitative research approach was used and the research design adopted for the present study was quasi-experimental pre-test and post-test design. The target population for the study was elderly people in selected old age homes in New Delhi. Sample size was 60. The tool taken for the study was Hamilton Anxiety Scale. Purposive sampling technique was used.

Result: There was severe anxiety in 90% of the aged before the administration of the relaxation technique which reduced to 30 % after the intervention. This study concluded that Jacobson's progressive muscles relaxation technique was effective in reducing anxiety among elderly people.

Key words: Level of anxiety, Jacobson's progressive muscle relaxation technique, elderly people, old age homes.

Background of the Study

"If you want to conquer the anxiety of life, live in the moment"

The world's population is aging rapidly. Between 2015 and 2050, the proportion of the world's older

adults is estimated to almost double from about 12% to 22%. In absolute terms, this is an expected increase from 900 million to 2 billion people over the age of 60. Older people face physical and mental health challenges which need to be recognized. Over 20% of adults aged 60 suffer from a mental or neurological disorder and 6.6% of all disability (disability-adjusted life years-DALYs) among people over 60 years is attributed to mental and neurological disorders. These disorders in older people account for 17.4% of Years Lived with Disability (YLDs).¹

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The most common mental and neurological disorders in this age group are dementia and depression, which affect approximately 5% and 7% of the world’s older population, respectively. Anxiety disorders affect 3.8% of the older population, substance use problems affect almost 1% and around a quarter of deaths from self-harm are among people aged 60 or above.²

The term anxiety has become a part of our everyday life. The concepts of anxiety may differ according to the individual’s state of contexts and interpretations. It is recognized that certain amount of anxiety is desirable, productive and can facilitate the individuals to grow but when the anxiety exceeds it disturbs the normal functions and the human body undergoes a number of autonomic physiological changes such as perspiration, restlessness, discomfort, palpitation and tightness in the chest.³

Aging is a natural process and an inevitable one. Elderly are in a crucial phase where the physiological, psychological and socio-cultural changes in contribute to developing anxiety.

Anxiety is a normal emotion ⁴ and all human beings develop it as a means of protection from danger and threat. Persistent or extreme anxiety can seriously decrease the quality of life and can be a sign of other problems, such as depression, dementia, physical illness, or side effects

of prolonged drug treatment. Anxiety can be a symptom associated with many medical disorders common in older adults, including heart disease, lung disease, thyroid and other endocrine problems, neurologic illness, dietary problems (e.g., excess caffeine intake or vitamin B12 deficiency), psychological illnesses, and side effects to medications.⁵

Studies have shown that generalized anxiety disorder is more common in the elderly, affecting 7% of seniors, than depression, which affects about 3% of seniors. Surprisingly, there is little research that has been done on this disorder among elderly as reported by a research study.⁶

Methodology

Research Approach

Quantitative research approach was used in the present study to assess the level of anxiety among the elderly people undergoing Jacobson’s progressive muscle relaxation technique in selected old age homes in New Delhi.

Research Design

A Quasi-experimental pre-test and post-test design was used in this study .

Table 1. Tabular presentation of the research design

Group	Pre-test	Intervention	Post-test
Experimental group(elderly people)	O1	X	O2
Control group(elderly people)	O3	-	O4

O₁-Pre-anxiety assessment among the Experimental group

O₂-Post- anxiety assessment among the Experimental group

X- Implementation of Jacobson’s progressive relaxation technique to the Experimental group

O₃-Pre- anxiety assessment among the Control group.

O₄- Post- anxiety assessment among the Control group

Independent variable

Jacobson’s progressive relaxation technique.

Dependent Variable.

Level of anxiety.

Setting

This study was conducted in Nyi Dunia & Ashriwad old age homes.

Population

In this study, the population includes elderly people aged 60-70 years.

Target population:

The target population consist of elderly people those who are suffering with anxiety.

Accessible population:

The accessible population consist of elderly people those who are residing at selected old age homes in New Delhi.

SAMPLE

Elderly people having anxiety who were residing in Nyi Duniya & Ashriwad old age home.

SAMPLING TECHNIQUE

In this study, purposive sampling technique was used to select the sample.

SAMPLE SIZE

60

CRITERIA FOR SAMPLE SELECTION**Inclusion Criteria**

Ø Elderly people who are residing in the selected 2 old age homes.

Ø Elderly who are willing to participate in the study.

Ø Elderly Males and females who are aged 60-70 years.

Ø Elderly people who are able read and speak Hindi.

Exclusion Criteria

Ø Elderly persons who are not able to perform relaxation techniques.

Ø Elderly persons who are disoriented.

Ø Elderly who are taking anti-anxiety drugs.

Ø Elderly people who are having any physical deformities

Development of Tool

The research instrument was developed by doing study from the literature review. The primary and secondary sources of literature were reviewed to develop the appropriate tool. Validity was obtained from Nursing professors, Statistician and an Ayurvedic doctor. Their opinions and valuable suggestion were incorporated in the tool and it was finalized by the guide.

Description of the Tool

Tool 1: Demographic proforma.

Tool 2: Hamilton anxiety scale.

Tool 1- Demographic Proforma.

The instrument was developed by the researcher. The tool was used to collect the background information of the participants. The tool had items such as age, gender, educational status, religion, duration of stay in old age home, source of information and any physical or mental illness.

Tool 2- Hamilton anxiety scale.

In this study, Hamilton anxiety scale was used to assess the anxiety level among elderly. In this scale, 14 items were given with a total score of 56. Each item had 0-4 score level. 0= No anxiety, 1 = mild anxiety, 2=moderate anxiety, 3=sever anxiety, & 4=very severe anxiety.

Content Validity

To ensure the content validity of the tool, the tool along with the letter requesting opinion and suggestion from experts and criteria checklist were given to nine experts in the field of pediatrics, psychiatry and community department. The experts were requested to give their opinion regarding agreement or disagreement in terms of relevance, accuracy and appropriateness. Language validity was established by Hindi language experts.

Language Validity

The language validity was established by translating the tool to Hindi and retranslating to English by language experts.

Reliability

The reliability of the tool was recognized by administering the tool to 6 samples who were residing in the old age home, Guru Vishram Viridh ashram.. The reliability coefficient was calculated by split half method and using spearman brown prophecy formula. The reliability coefficient obtained was ($r = 0.80$).

Discussion

A study to assess the effectiveness of Jacobson's Progressive relaxation technique on anxiety among elderly people of aged 60-70 years in selected old age homes at New Delhi.

The findings regarding sample characteristics

The results of the study show that in the experimental group the majority of samples (53.3%) belonged to the age group of 60-62 , (60%) of the sample were female, majority of samples were either widow/widower, 18 (60%) belonged to Hindu religion, most of samples were having their education status (60%) up to primary school , majority of the sample had the source of information 27 (90%) from mass media, most of samples were residing in old age homes 14 (46.7 %) <1 year, and 16 (53.3%) samples were not suffering from any physical or mental illness. In the control group the majority of samples were 22 (73.3%) were belong to age group of 60-62 year of age, 19 (63.3%) of the sample were female, majority of sample marital status was 13 (43.3%) widow/widower, 11 (36.7%) belonged to Hindu religion, most of sample were having education status to 13 (43.3%) primary school education , majority of the sample were getting of source of information 30 (100%) from mass media, most of sample were residing in old age homes 19 (63.3 %) <1 year, 12 (40.0%) sample were not suffering from physical or mental illness.

Objective 1: To assess the level of anxiety among elderly people aged 60-70 years.

Frequency and percentage distribution of the level of anxiety among the elderly people in

experimental and control group

In Experimental Group

- Majority of the elderly people (53.3%) were in the age group of 60 to 62 years age.

- 40% of the elderly were males and 60% were females.

- Most of the elderly people (60%) had only primary school education.

- The majority of elderly people (60%) belonged to Hindu religion.

- 33% of the elderly were either Widow or Widower.

- 90 % of elderly had received health information through mass media.

- 46.7% of the elderly were staying for < 1 year.

- 53.3% of elderly people had no physical & mental illness.

In Control group

- 73.3% were in the sage group of 60 to 62 years.

- 36.7% of the elderly were males and 63.3% were females.

- 43.3% had only primary school education.

- 36.7 % were following Hinduism.

- 43.3% were either Widow or Widower.

- 30 % of elderly were receiving health information from mass media.

- 63.3% of the elderly were staying in the old age home for < 1 year.

- 40 % of elderly people had neither physical & mental illness.

Objective 2:

Compare the pre-test and post-test level of anxiety among elderly people in experimental group and control group.

The Level of anxiety among elderly people was assessed using Hamilton anxiety scale. The pre-test score in the experimental group revealed that 27 (90%) were found with severe anxiety, 3 (10%) had very severe anxiety and in control group 29(96.7%) were found with

severe anxiety & 1(3.3%) had very severe anxiety. The post-test score of the experimental group showed that 21 (70%) had moderate anxiety, 9 (30%) had Severe anxiety and in control group 28(93.3%) were found with severe anxiety & 2(6.7%) had very severe anxiety.

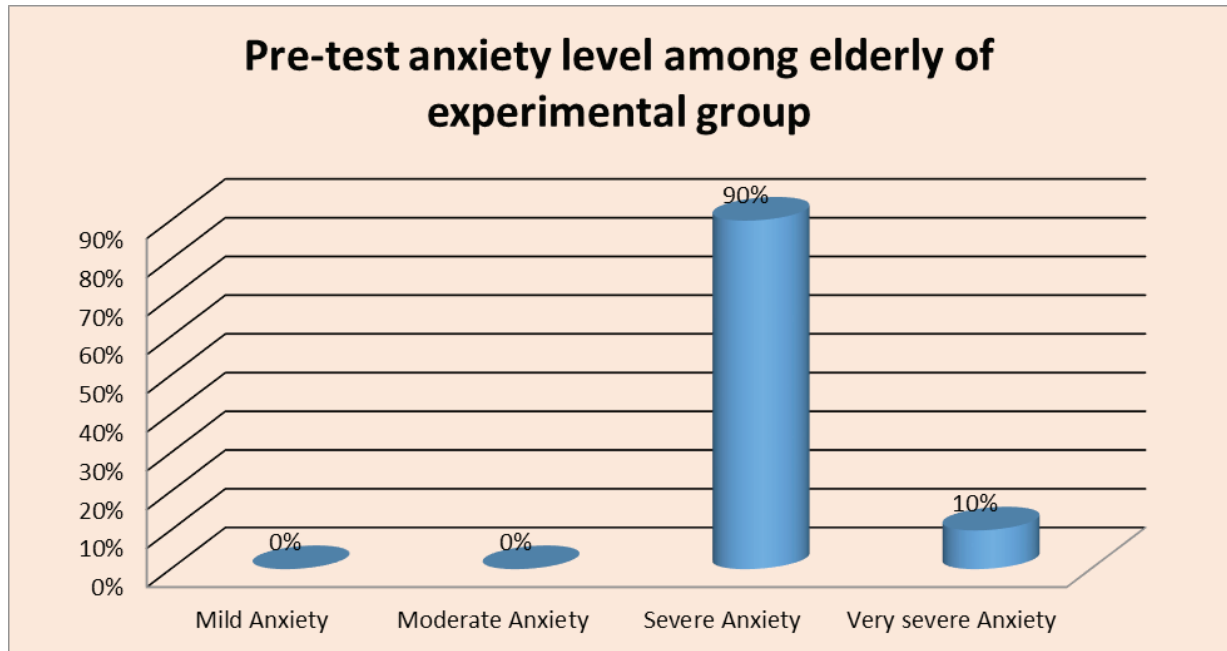


Figure 1:- Pre-test anxiety level among elderly of experimental group

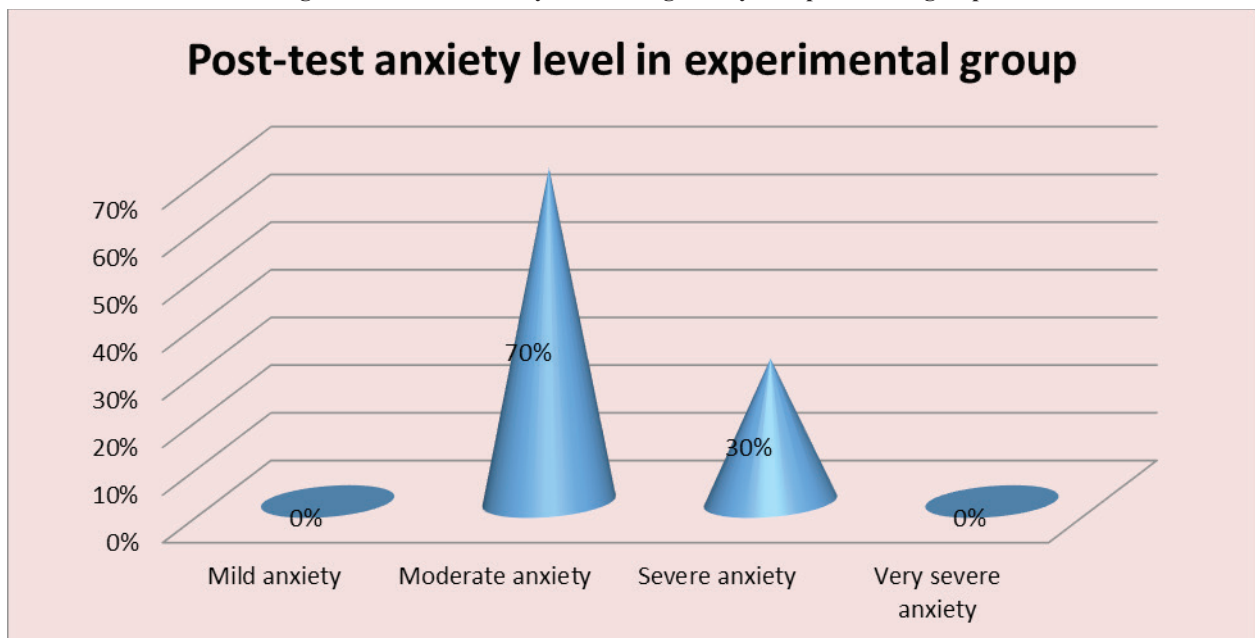


Figure 2:- Post-test anxiety level among elderly in experimental group

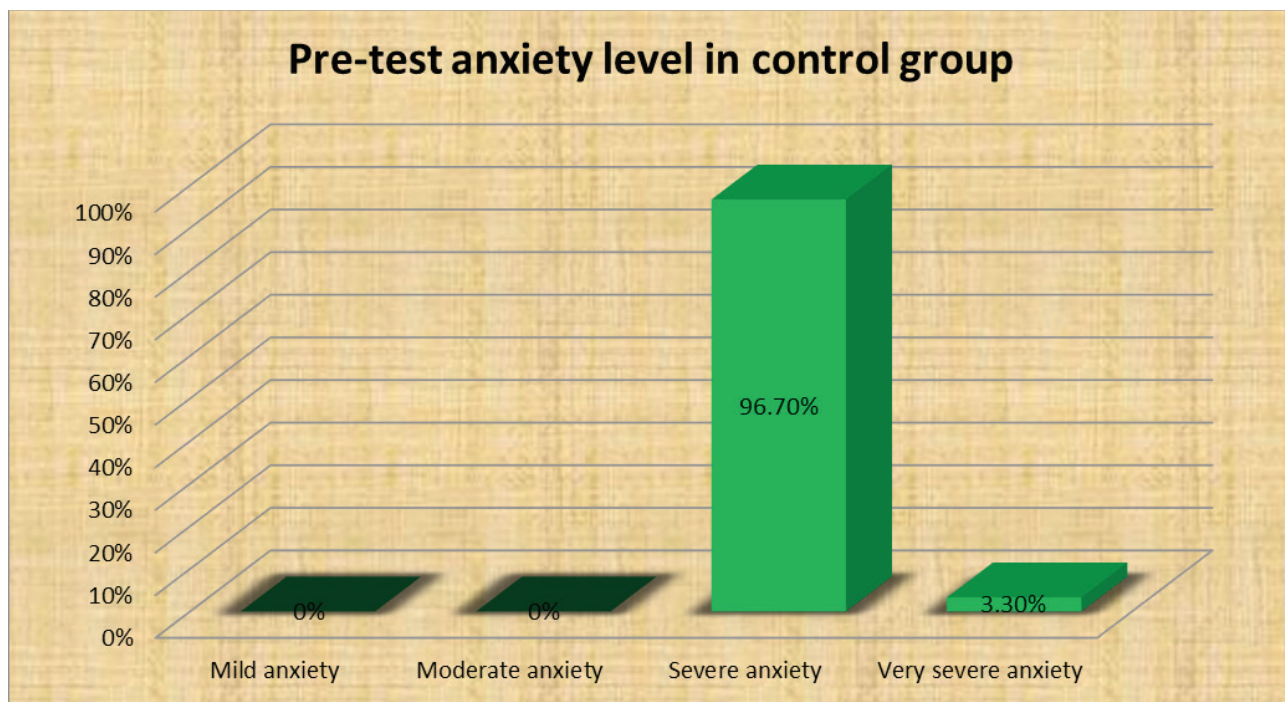


Figure 3:- Pre-test anxiety level among elderly in control group

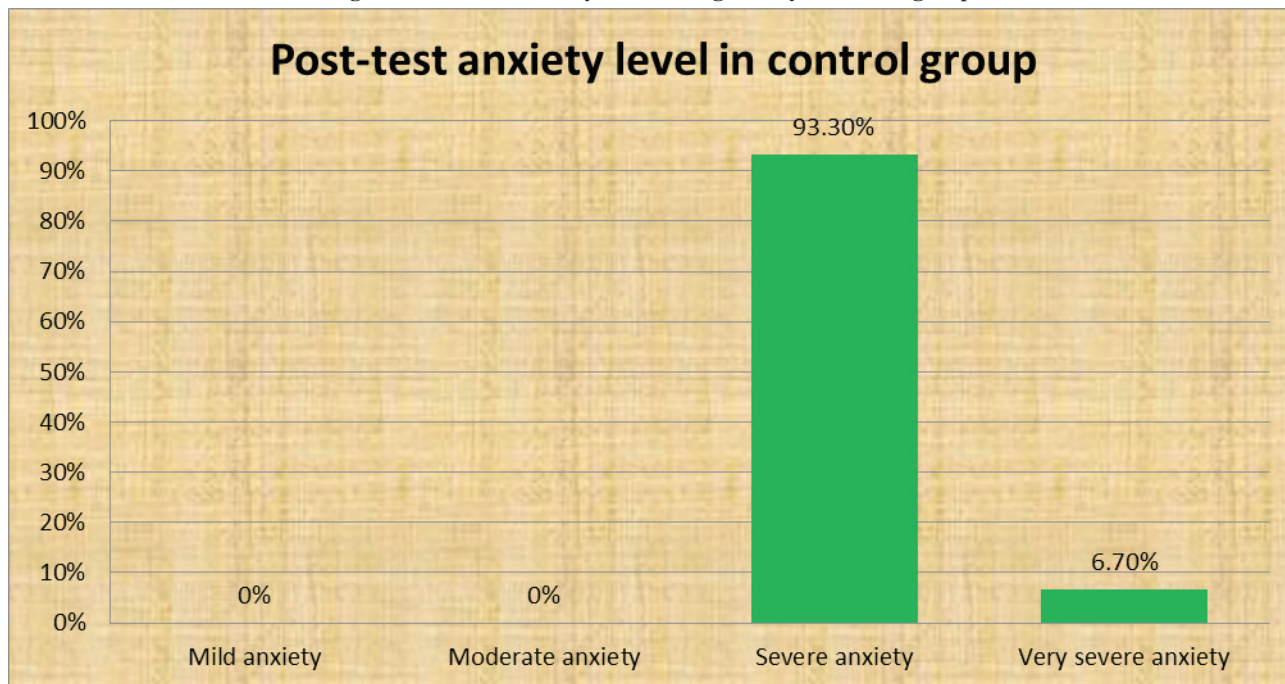


Figure 4:- Post-test anxiety levels among elderly in control group

Effectiveness of the Jacobson’s progressive relaxation technique on anxiety.

The mean anxiety score among elderly in experimental group during pre-test was 28.07 with standard deviation of 1.911 and post-test was 23.53 with a standard deviation of 1.717. In this group the mean difference between pre& post-test score was 4.54.

It was found that there was a significant difference between the mean pre-test and mean post-test anxiety level in experimental group which clearly indicated that t- calculated value $t=17.784$ is more than t-table value at 0.05 level of significance, hence null hypotheses were rejected and research hypotheses were accepted. Progressive muscles relaxation technique was found

to be effective in reducing anxiety level among elderly people.

Objective 3: Association between the anxiety level and selected demographic variables

There was no statistically significant association found between anxiety level and the selected demographic variables such as elderly age ($p = .117$), gender ($p = .745$), religion ($p = .888$) marital status ($p = .813$), education ($p = .474$), source of information ($p = .144$), duration of stay in the old age home ($p = .580$), and any physical or mental illness ($p = .533$).

The above results indicate that there was no significant association was found between post-test anxiety levels with selected demographic variables in experimental group. Hence it found that Null Hypotheses H02 was accepted.

Conclusion

This study has shown that the administration of Jacobson's progressive muscles relaxation technique was effective in reducing anxiety among elderly people aged 60-70 years in experimental group. There was no significant association between the post-test scores of anxiety level with selected demographic variables in experimental group. These kinds of relaxation techniques should be regularly given to the elderly to experience reduction in the levels of anxiety which can improve their quality of life.

Ethical Clearance: Institutional ethics committee, School of Medical Science and Research, SU.UP.

Conflict of Interest: There is no conflict of interest.

Source of Funding: Sharda University

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Determinants of Depressive Disorder among Elderly Stroke Patients in the Northeast of Thailand

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Abstract

Background: Stroke is the 2nd leading cause of death and 3rd rank of disability in the world including Thailand as well. This research aimed to determine the trend and investigate factors associated with depressive disorder among elderly stroke patients in the Northeast of Thailand.

Method: This cross-sectional study was conducted among 612 elderly stroke patients who were multistage random sampling from four provinces of the Northeast of Thailand to response to a structured questionnaire. Multiple logistic regression was performed to identify the factors influenced on depressive disorder of elderly stroke patients in the Northeast of Thailand.

Result: Among the total of 612 elderly stroke patients, 77.61% (95%CI: 74.10-80.85) had depression disorder. Factors that were associated with depressive disorders among elderly stroke patients were; impaired daily activities (adj.OR=15.82; 95%CI: 8.36-29.91), low access to health service (adj.OR=6.01; 95%CI: 3.20-11.28), rehabilitation at home (adj.OR=4.56;95%CI:2.52-8.24), unemployment (adj.OR=2.02; 95%CI: 1.20-3.36) when controlling other covariates including age, education, income, chronic disease, duration of illness and health insurance.

Conclusion: More than two-third of elderly stroke patients had depressive disorders. Limitation in performing daily activities, poor access to health services, inadequate rehabilitation and unemployment were associated with depression among elderly stroke patients in the Northeast of Thailand.

Key words: *Depressive disorders, Elderly, Northeast of Thailand, Stroke*

Introduction

Stroke is the world 2nd leading cause of death and 3rd rank of disabilities. Globally, approximately 6.7 million people were died because of stroke and more than 3 in 4 deaths occurred in middle and low-income countries¹. The risk is increasing with age among both males and females². Stroke was also the main cause of disability and dependency needed from other people because on nervous system. The patients who survive from stroke

will have long term effect on physical deficiency³, loss of sight, speech, or movement and decrease brain ability⁴.

In Thailand, stroke was the 2nd leading cause of death. Between 2011 and 2015, the mortality rates of stroke were slightly increased from 30.0 to 43.3 per hundred thousand population⁵ of which 80% was ischemic stroke whereas the rest 20% was cerebrovascular disorder⁶. The Ministry of Public Health reported that 1.4 times increased of hospitalization due to stroke between 2007 and 2013⁷. The Northeast of Thailand, the biggest region number of elderly and over in 2016 was 3,117,763 or 14.21% with the ratio between elderly males and females was 1 to 1.2⁵. Being in the elderly age, they are mostly encounter various problems related to changes especially

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physical and psychological deterioration which made them weak and ill⁵. If they suffer chronic diseases such as stroke, mental disorders could be more prevalence. Depressive disorder influenced on stroke patients as well as other diseases such as hypertension, diabetes, cancer and substance abuse⁸. After the stroke, from 3 months to 3 years, there were more than 1 in 3 of the patients had depression of which the prevalence was up to 25%. Most of them were at the extreme level, 24 % of them had emotional expressions such as angry, irritable, anxious, sad, fear, hopeless and suicide leading causes⁹. Stroke patients who had experience with depression are burden on family and their society because of ignoring follow up, treatments, and rehabilitation. Therefore the more slowly and more severity of healing of the illness can be made¹⁰. The impact of depression effected on physically, mentally and socially, as a result, the quality of life of patients has decreased¹¹.

Little is known on depression among elderly stroke patients especially in the Northeast part of Thailand. Therefore, the objective of this study was to determine the pattern of stroke and investigate the factors associated with depression among elderly stroke patients in the Northeast of Thailand.

Material and Method

Study Design

This cross-sectional study was conducted among 612 elderly stroke patients who were recruited by using a multistage random sampling from four provinces of the Northeast of Thailand including Khon Kaen, Roi Et, Maha Sarakham and Kalasin provinces. The inclusion criteria were persons aged 60-year-old or above, lived in Northeast of Thailand and were diagnosed as had stroke, and were ongoing treatments for more 4 weeks. The elderly stroke patients who were critically ill or could not communicate with the researcher were excluded from the study. The depression assessment was used by 9 questions-depression screening test in native of Isan (Northeast) dialect developed by Suwana

Arunphongphaisan in 2006¹² was used to identify the depressive disorder.

Data Analysis

A simple logistic regression was used to identify the association between each independent variable and depressive disorders. The independent factors that had p-value <0.25 were processed to the multivariable analysis using the multiple logistic regression to identify the association of all determinants and depressive disorder when controlling the other covariates. The magnitude of association was presented as adjusted odds ratio (Adj.OR), 95% confidence interval (CI). P-value <0.05 was a statistically significant level.

Results

Among the total of 612 elderly stroke patients, 56.05% were females with the average age 67.92 ± 6.31 years old. Most of them were married (71.57%) and finished primary school (87.65%). More than half were unemployment (57.19%) with the median monthly income of 10,000 Baht. As high as 62.91% were in debt, and 20.10% of the respondents borrowed from the informal sectors. More than half of the respondents (55.56%), almost all had chronic disease (88.56%) of which 45.57% had hypertension and 44.10% had diabetes. Almost all were ischemic stroke patients (94.61%). Most of them had stroke less than 5 years (65.20%), almost all rehabilitation at home (86.27%). In addition, almost all of them had universal health insurance (88.73%). However, about half had poor access to health services (50.16%). In addition, most of them did not smoke and drink alcohol, 72.39% and 65.36%, respectively. 86.60% of them were able to practice some daily activities.

There were 77.61% of the elderly stroke patients in the Northeast of Thailand had depressive disorder. However, most of the had mild depressive disorder (73.85%) whereas less than five percent had moderate to severe depressive disorder (Table1)

Table 1. Number and percentage of depressive disorder among elderly stroke patients in the Northeast of Thailand (n=612)

Depressive disorder	Number	Percent	95%CI
No (< 7points)	137	22.39	19.14 - 25.89
Mild (7-12 points)	452	73.85	70.18 – 77.29
Moderate (13-18 points)	21	3.43	2.13- 5.19
Severe (\geq 19 points)	2	0.33	0.03- 1.17

The multiple logistic regression indicated factors that were associated with depression among elderly stroke patients were; could perform only some daily activities (adj.OR= 15.82; 95%CI: 8.36-29.91), had poor access to health services (adj.OR= 6.01; 95%CI: 3.20-11.28), were rehabilitated at home not at a hospital (adj.OR=4.56;95%CI:2.52-8.24), unemployment (adj.OR=2.02; 95%CI: 1.20-3.36) when controlling other covariates including age, education, income, chronic disease, duration of illness and health insurance. (Table 2)

Table 2: The multivariable analysis of factors associated with depressive disorder among elderly stroke patients in the Northeast of Thailand, using the GLMM model presenting odds ratios, adjusted odds ratios, 95%CI and P-value (n=612)

Factors	Number	% Depressive disorder	OR	adj. OR	95%CI	P-value
Be able to perform daily activities						<0.001
Could perform all activities by themselves	82	23.17	1	1		
Could perform only some activities by themselves	530	86.04	20.43	15.82	8.36- 29.91	
Access to Health service						0.007
Good	307	60.26	1	1		
Poor	305	95.08	12.74	6.01	3.20 - 11.28	
Rehabilitation						0.007
Hospital	84	45.24	1	1		
Home	528	82.77	5.81	4.56	2.52-8.24	
Employment status						0.007
Employed	262	65.27	1	1		
Unemployed	350	86.86	3.51	2.02	1.2-3.36	

Discussion

Two-third of elderly stroke patients in the Northeast of Thailand had depressive disorder (77.61%), the finding of our this study was in line with a systematic review and meta-analysis on depression after stroke which reported the prevalence of stroke was ranking from 25 to 79%¹³. It was also similar with the finding from a study in Bangladesh where the prevalence of depression was 70%¹⁴. The possible reasons might be that when stroke occurs, it can be the main cause of disability and dependency which needed helps from other people³. The depressive disorder might also more prevalent from the long-term effect on physical deficiency, hearing problem, and decrease brain ability⁴. These conditions make them feel depress to be burden of their family¹⁰. In addition, the long duration of illness while not being self- help will be an opportunity to increase the level of depression. Due to stroke, if the body condition cannot return to normal, impact on their job or daily activities will lead them to lack self-esteem, self-negative and as the result, stress can develop into depression¹⁵.

This study observed that be able to perform only some daily activities by themselves were strongly associated with depression disorder among elderly stroke patients in the Northeast of Thailand. It was similar with the result from a study in Bangladesh which report that those who unable to perform daily activities by themselves had 14.9 time higher chances to have depression than those who can perform daily activities by themselves¹⁴. It might be that when elderly got stroke patient, they suffered various consequences especially, physical and psychologically deterioration which made them to weak and ill⁵.

Poor access to health services had influence on depression among these elderly stroke patients. This finding was supported by a study on depression predictor¹⁶. Even though almost all of them had health insurances, they still bared the opportunity costs. The expenses on traveling, food, accommodation, and medical expenses beyond the insurance coverage. In addition, most of them need someone to take them to the hospital, they had problems on accessibility to health services¹⁷, of which their health problems would not properly solve. Therefore, they are prone to chronic stress and depression.

Rehabilitation at home, not at hospital was strong associated with depressive disorder. It could be explained that the effectiveness of rehabilitation at home is lower than in the hospital which have better equipment, health personnel and training protocol. Therefore, their disability and dependency will be prolonged. This finding was in line with a study in China which found that low levels of state self-esteem, social support satisfaction and functional ability were associated with depression among Chinese stroke survivors six months after discharge from a rehabilitation hospital¹⁸.

Among elderly stroke patients in the Northeast of Thailand, unemployment was also associated with depression. This result was support by a study among African post-stroke depression which observed that unemployment had influence on depression¹⁹. Some of the occupational characteristics were related with differences occupation type. Social values and activities required physical competency. In case of stroke, physical disability and movement are affected. As the result, loss of the ability to perform duties was occurred, and economic burden within family was eminent.

Conclusion

Almost two-third of elderly stroke patients in the Northeast of Thailand had depressive disorder. The limitation in daily activities, poor access to health services and rehabilitation as well as unemployment were associated with depression among elderly stroke patients. Relevant sectors should strengthen accessibility to health services especially rehabilitation. Special attentions should be for those with limitation in performing daily activities as well as those with financial hardship.

Acknowledgement

The authors would like to express our sincere appreciation to all elderly stroke patients for their times and information. Special thanks to the Faculty of Public Health, Khon Kaen University, Khon Kaen University, Thailand for the supports.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE602098.

Source of Funding- Self-Funding.

Conflict of Interest- Without

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Influence of Family, Peer Factors and Comprehensive Sexuality Education on Teenage Pregnancy in the Northeast of Thailand: A Case Control Study

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Abstract

Background: More than one third of teenage pregnancies was found in the Northeast of Thailand. The objective of this research was to examine the influence of personal, family, peer factors, sexuality attitude, and the comprehensive sexuality education (CSE) on teenage pregnancies in the Northeast of Thailand.

Methodology: This case control study was conducted with the 1:3 proportion of case and control. The case were 60 teenage aged 15-19 years old, lived in the Northeast of Thailand, and delivered a baby less than 1 years. The control was 180 teenagers aged between 15 and 19 years old in the same region but never pregnant. Multiple logistic regression analysis was used to identify factors associated with teenage pregnancy presenting adjusted odds ratio and 95% confident Interval for the magnitude of association. P-value of <0.05 was statistically significant cut point.

Result: Among 240 teenagers, 60 were teenage pregnancy with the mean age of 17.09±0.63 years old, whereas 180 teenagers were the control group with mean age of 16.83±0.56. The multiple logistic regression analysis indicated that had no to one brother (adj.OR=5.08; 95%CI: 2.28-11.35), had friend lived with her boyfriend (adj.OR=4.97; 95%CI: 2.33-10.58), had average level of sexual attitude (adj.OR=4.68; 95%CI: 2.82-10.79), had average level of CSE (adj.OR=4.56; 95%CI: 2.93-10.52) were associated with teenage pregnancy, when controlling other covariates.

Conclusion: Family and peer factors, sexual attitude, as well as comprehensive sex education had influence on teenage pregnancy in the Northeast of Thailand. Effective comprehensive sex education is in need to help improve sexual attitude especially among those lived in the vulnerable family and peer environment. Families should closely supervise their children on sexuality, gender roles and social norms.

Key words: *Environment, Family, Northeast of Thailand, Peer, Teenage Pregnancy*

Introduction

Teenage pregnancy means pregnancy in a woman aged 10-19 years (WHO). About 16 million girls aged 15 to 19 (11%) and some one million girls under 15 give birth every year-mostly in low- and middle-income countries

(95%)¹. Many of teenage pregnancy and childbirth are not planned and unwanted, of which are more likely occurred in poor, uneducated and rural communities. Pregnancy and childbirth complications are the second cause of death among 15 to 19-year-olds globally². Some three million unsafe abortions among girls aged 15 to 19 take place each year, contributing to maternal deaths and to lasting health problems. Early childbearing increases the risks for both mothers and their newborns. In low- and middle-income countries, babies born to mothers under 20 years of age face a 50% higher risk of being

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stillborn or dying in the first few weeks versus those born to mothers aged 20-29. The younger the mother, the greater the risk to the baby. New-borns to teenage mothers are also more likely to have low birth weight, with the risk of long-term effects. Teenage pregnancy can also have negative social and economic effects on girls, their families and communities. Many girls who become pregnant must drop out of school. A girl with little or no education has fewer skills and opportunities to find a job. This can also have an economic cost with a country losing annual income a young woman would have earned over her lifetime if she had not had teenage pregnancy^{1,2}.

In Thailand, there were increasing proportion of teenage mothers from 12.9% to 15.3% between 2004 and 2016. Infants of young mothers had various disabilities, especially gastroschisis and prematurity^{3,4}. There were increasing risk of low birth weight among babies of young mothers⁴. In addition, failed attempts at self-induced abortion can have negative health outcomes for infants⁵. Lack of skills, family planning, and knowledge about sex had made teenage had premarital sexual relationship and unplanned pregnancy. Living with both parents was reported as reducing risk behaviour in teenage age 13-20 years⁶ as well as reduction of crime, violence, and use of drugs and alcohol⁷. Family member had influence on sexuality and pregnancy of teenage such as had teenage pregnancy sister and or mothers as well as had separated parents⁸. Financial hardship and low paid occupation also increased the risk of teenage pregnancy⁹. Peer factors such as had pregnant friends were associated with teenage pregnancy¹⁰. UNICEF Thailand, 2015 reported the influences of modernizing society norm and social sections toward premarital sex which shifting the direction to acceptable of premarital sex in Thai society which reported endorsed by 40% of male teenagers and 36% of female teenagers¹¹. Lack of communication about sex between parents and teenagers as well as limited parental supervision creates an environment where teenagers may decide to have sex without proper protection. Some girls who performed well in school and did not exhibit other risk behaviors were more likely to become pregnant since they did not have sufficient knowledge and skills to assert and protect themselves in sexual situations¹².

The Thai government finalized the Strategic Plan

for Teen Pregnancy Prevention and Solutions for fiscal years 2015-2024 and issued an Act for prevention and solution of the teenage pregnancy problem, B.E.(2016). This Act aiming at protecting the reproductive rights of individuals, clearly defining the roles and responsibilities of different agencies, improving the delivery of services, improving Comprehensive Sexuality Education (CSE) in schools for the prevention and solution of teenage pregnancy problem

The Bureau of Reproductive Health reported that 12.9% of all Thai pregnancies were among women under 20 years of age, of which the proportion of teenage pregnancy was highest in the Northeast region (37.2%)¹³. Therefore, better understanding of the factors that differentiate sexually experienced between teenagers who become pregnant from those who did not will help relevance sectors to develop more effective programs to reduce teenage pregnancy. This study was aimed to identify influence of personal characteristics, family and peer factors, sexuality knowledge and attitude as well as CSE on teenage pregnancy in the Northeast of Thailand.

Material and Method

Study Design

This unmatched case control study was conducted among teenage women in the Northeast of Thailand. The sample size in this study was calculated by the following formula¹⁴. The proportion of case and control of 1:3. The case were 60 teenager aged 15-19 years old, lived in 3 provinces of the Northeast of Thailand, and delivered a baby within less than 1 years, literate, and willing to participated. The control were 180 teenagers, aged between 15 and 19 years old in the same region, never pregnant as well as literate, and willing to participated. Both case and control filled the self-administered questionnaire.

Data Analysis

Simple logistic regression was used to identify the association between each independent variable with teenage pregnancy. The factor that had p-value less than 0.25 were the proceeded to the multivariable analysis. Multiple logistic regression analysis was used to identify factors associated with teenager pregnancy when controlling the effect of covariates, presenting adjusted odds ratio (adj.OR) and 95% confident Interval. The

statistically significant level was set at p-value <0.05.

Results

The mean age of the case was 17.09±0.63 years old whereas the control was 16.83±0.56 years. Just about half of the cases (33.33%), but most of the control (75.56%) study high school. Half of the case was marriage without registration but almost all the control was single (98.89%). More than half of cases were unemployed (56.67%) whereas 94.44% of control were students. Only about half of cases lived with parents (51.67%) but 72.78% of the control did.

Concerning family factors, almost all the case's family income was lower than the average family income of the Northerners in year 2018 (20,271 Baht/month), whereas as only 68.33% among control. About half of cases had 1-2 siblings, but it was 70.00% among control. Most of the cases had 0-1 brothers, whereas 59.44% of control had 2-3 brothers, 61.67% of the cases had 2-4 sisters, 52.22% of control had 0-1 sister. Most of the cases and control were 2nd and 5th children of their parents. Most of case and control did not have teenage

pregnancy sibling. Similar proportion of case and control had no teenage pregnancy mother.

Peer factors, most of the case had only 3-5 close friends while 61.67% of the control had more than 5 close friends. Majority of cases had married friend while 68.33% of control had friend who were single. Most of cases had a friend lived with boyfriend, but 71.67% of control had friend who did not live with their boyfriends. Half of cases had pregnant friend whereas 71.11% of control had non pregnant friends.

Concerning knowledge, attitude and CSE. Knowledge on sexuality which covered reproductive health, contraceptive methods and pregnancy were assessed and compared among cases and control. Similar proportion of case and control had highest of knowledge, followed by average level of which 61.67% among case and 58.34% among control. The most of cases had average level of attitude on sexuality, but 61.67% of control had highly appropriate attitude sexuality. In addition, the most of cases had average level of CSE whereas 62.22% of controls had high level of CSE.

Table1: Family and peer characteristics, knowledge and attitude towards sexuality and CSE of case and control

Characteristics	Case=60		Control=180	
	number	%	number	%
Family income (Baht/month)				
≥20,271	5	8.33	57	31.67
<20,271	55	91.67	123	68.33
Number of brothers				
0-1	46	76.67	73	40.56
2-3	14	23.33	107	59.44
Number of sisters				
0-1	23	38.33	94	52.22
2-4	37	61.67	86	47.78
Sibling Sequence				
1	16	26.67	88	48.89
2-5	44	73.33	92	51.11
Having sibling pregnant while been teenage				
Yes	7	11.67	18	10.00
No	53	88.33	162	90.00
Having mother pregnant while been teenage				
Yes	11	18.33	22	12.22
No	49	81.67	158	87.78

Cont... Table1: Family and peer characteristics, knowledge and attitude towards sexuality and CSE of case and control

Characteristics	Case=60		Control=180	
	number	%	number	%
Number of Close friends				
1-2	14	23.33	17	9.44
3-5	42	70.00	52	28.89
>5	4	6.67	111	61.67
Have Marriage friend				
Yes	34	56.67	57	31.67
No	26	43.33	123	68.33
Have friend live with boyfriend				
Yes	43	71.67	51	28.33
No	17	28.33	129	71.67
Have pregnant friend				
Yes	30	50.00	52	28.89
No	30	50.00	128	71.11
Knowledge on sexuality level				
High	17	28.33	44	24.44
Average	37	61.67	105	58.34
Low	6	10.00	31	17.22
Attitude on sexuality level				
Appropriate	12	20.00	111	61.67
Average	48	80.00	69	38.33
Comprehensive sexuality education				
High	11	18.33	112	62.22
Average	49	81.67	68	37.78

The individual independent variable was test of association on teenage pregnancy using a simple logistic regression. The factors which had p-value<0.25 were proceeded to the multivariable analysis using multiple logistic regression. These factors were, family income, number of brothers and sisters, number of brothers, number of sisters, sequence of offspring, had teenage pregnancy mother, number of close friend, had friend

at school, had married friend, had friend lived with boyfriend, had pregnant friend, sexuality attitude level, and CSE level. After the multivariable analysis the final model indicated that had 0-1 brother, had friend lived with a boyfriend, had average level of attitude toward sexuality, had average level of CSE were associated with teenage pregnancy when controlling other covariates.

Table 2: The multivariable analysis of factors associated with teenage pregnancy in the Northeast of Thailand

Factors	Case n (%)	Control n (%)	Crude OR	Adjusted OR	95%CI	P-value
Number of brothers						<0.001
2-3	14 (23.3)	107(59.40)	1	1		
0-1	46 (76.7)	73 (40.60)	4.82	5.08	2.28-11.35	
Have friend living with boyfriend						<0.001
No	17(28.3)	129 (71.67)	1	1		
Yes	43 (71.7)	51(28.33)	6.35	4.97	2.33 -10.58	
Sexual attitude level						<0.001
Appropriate	12 (20.00)	111 (61.67)	1	1		
Average	48(80.00)	69 (38.33)	6.43	4.68	2.82- 10.79	
CSE level						<0.001
High	11 (18.33)	108 (60.00)	1	1		
Average	49(81.67)	72 (40.00)	7.34	4.56	2.93-10.52	

Discussion

The result showed that number of brothers, had friend lived with boyfriend, sexual attitude level, and CSE were associated with teenage pregnancy in the Northeast of Thailand. Roles of family factors, teenagers who had 0-1 brothers had a significantly higher chance to get pregnant than those who had 2-3 brothers. Had no, or only one brother, the teenagers would not be familiar with boys. In addition, they might have the one that sincerely takes good care of them, provided advice and protected them². However, our result was inconsistent with the research of factors associated with adolescent pregnancy in a rural district of Kalasin province, Thailand reported that the number of brothers was not significant factor with adolescent pregnancy. It might be that in Thai culture when a girl has brothers, she will meet her brother's friend and might develop relationship with the girl. If more brothers, the girl would have more

chances to meet more brother's friend which increase the risk of pregnancy among the girls if her brother/ and or family did not supervise them properly.

With reference to peer factors, teenage women who had a friend lived with her boyfriend, had a significantly higher risk to get pregnant than the teenager who had no friend lived with a boyfriend. The sexual behaviors of a close friend has more effect on teenager behaviors since they need acceptance from friends. Therefore, they try to copy attitude, value and actions. In addition, normative influence means the group of friends had social pressure to force them². Peer network had heavily weighted toward a close friend, so close friend predicts girls perception of pregnancy norms with statistical significance on adolescent pregnancy¹⁵.

Concerning sexual attitude level, teenager women who had average level of sexual attitude had significantly

higher chances to get pregnant than teenagers who had high appropriate sexual attitude level. It was similar with the result of many studies which found that personal attitude and attitude towards sex and pregnancy of adolescences were associated with teenage pregnancy. The social-norms where adolescent pregnancy is seen to be a negative sight in the community^{16,17}. This study observed 61.67% of control had highly appropriate attitude whereas only 67% of cases had. Social impact on adolescent's attitude of which the social force may change their lifestyle to fit the social expectation, therefore a poorly developed or ambiguous attitude may direct people to rely on and to very effect by, which can influence individuals attitude and decision-making process influencing power. Teenage women who has average level of CSE had a significantly higher odds to get pregnant than teenagers who had high CSE. It was supported by that 60.00% of control had high level of CSE where almost all of cases had only average level (81.67%). Therefore, cases were less likely to have good knowledge and attitude on risk of pregnancy as well as protected themselves from unprotected or forced sexual relationship.

Conclusion

Family and peer factors, sexual attitude, as well as CSE were associated with teenage pregnancy. Effective CSE is in need to help improve sexual attitude especially among those who lived in vulnerable family and peer environment. School should improve teaching methods on CSE for a better outcome on sexuality knowledge, appropriated attitude and practices to prevent teenage pregnancy. Families should closely supervise their children on sexuality, gender roles and norms. Two ways communication is essential among parents and children especially on sexuality.

Acknowledgement: The authors would like to express our sincere appreciation to all teenage women, health personnel, teachers who contribute to this research. Special thanks to the Faculty of Public Health, Khon Kaen University and Ubon Ratchathani University for the supports.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE622172.

Source of Funding- Self-funding.

Conflict of Interest- Without.

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Endometrial Estrogen and Progesterone Receptor Expression and Blood Vessel Density in Abnormal Uterine Bleeding

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Abstract

Background: The aim of present study was to analyse endometrial estrogen and progesterone receptor expression and blood vessel density in cases of abnormal uterine bleeding.

Material and Method: The present study was conducted on specimens received from 266 patients presenting with abnormal uterine bleeding in reproductive age group (18-45 years) on endometrial biopsies and hysterectomy specimens. The intensity and distribution of ER, PR was evaluated using a semi-quantitative method Allred score. Also density of blood vessels /10 HPF was evaluated.

Results: Neoplastic cases were found among 9.4% (25) of the subjects whereas non-neoplastic lesions were present in 90.6% (241) of the subjects. Mean Allred scoring of estrogen and progesterone receptor in glandular component was highest among endometrial carcinoma. Mean Allred scoring of estrogen receptor in stromal component was highest among Hyperplasia without atypia (5.13±1.58). Mean progesterone receptor in stroma component was highest among Hyperplasia without atypia followed by disordered maturation and endometrial carcinoma.

Conclusion: The results of the present study showed that ER and PR expression are useful investigations. There expression varies in various causes of abnormal bleeding. Future studies with clinical trials could be done to try medical treatment of AUB.

Keywords: Abnormal uterine bleeding, Endometrial Carcinoma Estrogen receptor, immunohistochemistry, hyperplasia, Progesterone receptor

Introduction

Abnormal uterine bleeding (AUB) is the commonest presenting symptom in gynaecology. It occurs in 9-14% of women between menarche and menopause^{1,2}, significantly impacting quality of life and imposing financial burden³. The classification is based on the acronym "PALM- COEIN", which stands for polyp,

adenomyosis, leiomyoma, malignancy and hyperplasia, coagulopathy, ovulatory dysfunction, endometrial, iatrogenic, and not classified³.

Estrogen and progesterone receptors belong to the nuclear steroid receptor superfamily the effect of these steroid hormones are thought to be mediated through these receptors. The ER and PR IHC expression and distribution pattern may play an important role in endometrial function and pathogenesis⁴. The study of these receptors distribution in the endometrial glands could open the gate for medical treatment of cases of AUB and avoid unnecessary surgical intervention. The cause of the bleeding may be due to potentiation of the hormonal action through change in their receptor levels⁵. Also there is positive correlation between the endometrial angiogenesis and menstrual disorders. The

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alternation in blood vessel morphology and density also plays a significant role. Hence the present study was conducted to analyse endometrial estrogen and progesterone receptor expression and blood vessel density in cases of abnormal uterine bleeding.

Materials and Method

The present prospective cross-sectional hospital based study was conducted on specimens received from patients with abnormal uterine bleeding presenting with AUB in reproductive age group (18-45 years). The sample size for the present study was 266. The source of data for this study were patients undergoing endometrial biopsy/hysterectomy for complaints of abnormal uterine bleeding presenting in reproductive age group (18-50 years) over a period of 2 years. In the present study IHC was performed among 50 subjects, out of which 25 were neoplastic and 25 were non-neoplastic as control. The subjects were selected according to the following criteria:

Inclusion criteria: Hysterectomy and endometrial samples of reproductive and peri-menopausal age groups having abnormal uterine bleeding and patients presenting with menstrual irregularities like, irregular cycles, excessive and prolonged menstrual bleeding.

Exclusion criteria: Inadequate samples, patients with provisional diagnosis of infertility and women on hormone replacement therapy, oral contraceptive pills, intrauterine contraceptive devices or steroidal and non-steroidal anti-inflammatory medications.

Sample handling: Grossing and processing was done on the Hysterectomy specimens and endometrial tissues received. Specimens were fixed in 10% formal saline and then processing was done. Endometrial tissue was fixed as a whole while the hysterectomy specimen was cut and fixed overnight. The tissues were processed routinely to obtain 4-5 m thick paraffin sections and stained with Haematoxylin and Eosin. Lesions were categorised according to PALM-COIEN.

Sections stained by H & E stain were used for dating of endometrium. Findings were correlated with clinical history to formulate cause of abnormal uterine bleeding. Overall vascularity of endometrium in functionalis layer was judged by counting average number of blood vessels in 10 HPFs. Number of vessels was evaluated

in all cases on high power using 4µm sections stained with Haematoxylin and Eosin and the photomicrographs were taken at 40x magnification.

Antibody: Primary antibody used for ER and PR was Monoclonal mouse Anti-Estrogen Receptor clone ID5 (Sentier) and Monoclonal mouse Anti-Progesterone Receptor clone PR88 (Sentier) respectively. Expression of ER and PR receptors was observed in endometrial lining and stroma⁴.

Scoring criteria: The intensity and distribution of ER and PR was evaluated using a semi-quantitative method - Allred score. In Allred system of scoring, score 0-5 was given to cells depending on the proportion of cells which were stained (proportion score [PS]) and score 0 -3 depending on the intensity of staining (intensity score [IS]). Allred score is (PS + IS = AS)⁶.

Statistical Analysis

Data collected was tabulated in an excel sheet. The mean and standard deviation of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). Statistical difference between was determined using chi square test and the level of significance was $p < 0.05$.

Results

In the present study, endometrial biopsy and hysterectomy specimen were obtained from 76.3% and 23.7% of the total specimen (266) respectively.

Among the neoplastic cases, Hyperplasia without atypia, Atypical Hyperplasia and endometrial carcinoma was reported among 80%, 12% and 8% of cases respectively. Disordered maturation, Secretory/ Progesterone effect, Proliferative/Oestrogen effect, Non-secretory endometrium, Polyp, Adenomyosis, Leiomyoma and Endometritis were found among 44.81%, 22.41%, 13.28%, 4.98%, 4.56%, 5.39%, 3.32% and 1.24% of the non-neoplastic cases respectively (Table 1).

0-9 blood vessels / 10HPF was revealed among 14.1% of the non-neoplastic cases as compared to 4% of neoplastic cases. 40-49 blood vessels/10 HPF was found among 84% and 17.4% of the neoplastic and non-neoplastic cases respectively (Table 2).

In the present study, average blood vessel density was highest among Hyperplasia without atypia (42.60±3.21) followed by Polyp (38.80±3.78), Endometrial Carcinoma (38±0) and Atypical Hyperplasia (36.71±4.78). The least average blood vessel density was found among disordered maturation (20.17±3.81) followed by different phases of endometrium in context of leiomyoma (22.36±4.16) and non-secretory endometrium (24.51±4.98) as shown in Table 3.

In the present study, mean Allred scoring of estrogen and progesterone receptor in glandular component was highest among Endometrial Carcinoma (7±0, 7.67±2.92) followed by Hyperplasia without atypia (6.33±0.58, 7.67±2.92) respectively. Mean Allred scoring of estrogen and progesterone receptor in stromal component was highest among Hyperplasia without atypia i.e. 5.13±1.58, 6.90±2.92 respectively as shown in Table 4.

Table 1: Diagnostic spectrum of cases with AUB (PALM-COEIN)

Spectrum	N	%
Neoplastic cases (9.3%)		
Hyperplasia without atypia	20	80
Atypical hyperplasia	3	12
Endometrial Carcinoma	2	8
Total	25	100
Non-Neoplastic cases (90.7%)		
Disordered maturation	108	44.81
Secretory phase/ Progesterone effect	54	22.41
Proliferative phase/ Oestrogen effect	32	13.28
Non-secretory endometrium	12	4.98
Polyp	08	3.32
Adenomyosis	13	5.39
Leiomyoma	11	4.56
Endometritis	3	1.24
Total	241	100

Table 2: Blood vessels density in Neoplastic and Non Neoplastic categories

Blood vessels/10HPF	Neoplastic		Non-neoplastic	
	n (25)	%	n (241)	%
0-09	1	4	34	14.11
10-19	1	4	98	40.66
20-29	0	0	1	0.41
30-39	1	4	61	25.31
40-49	21	84	42	17.43
40-59	1	4	2	0.83
60-69	0	0	2	0.83
80-90	0	0	1	0.41
Chi square	10.32			
p value	<0.01*			

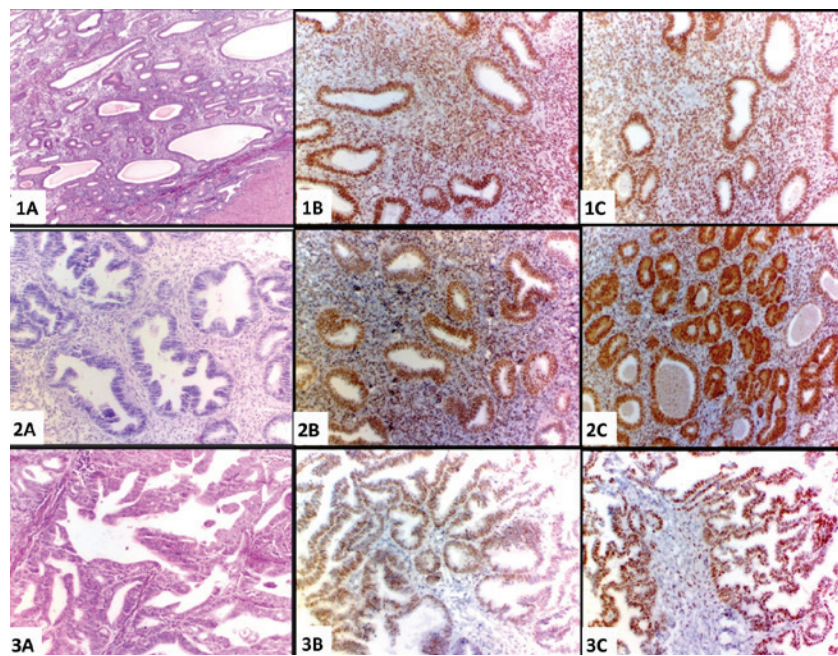
*: statistically significant

Table 3: Average number of blood vessels in different diagnostic categories/10 HPF

Spectrum	Cases	Average/ 10HPF
Hyperplasia without atypia	20	43
Atypical hyperplasia	3	37
Endometrial Carcinoma	2	38
Disordered maturation	108	20
Secretory/ Progesterone effect	54	31
Proliferative/ Oestrogen phase	32	34
Non-secretory endometrium	12	25
Polyp	08	39
Adenomyosis	13	33
Leiomyoma	11	22
Endometritis	03	30

Table 4: Mean Allred scoring of estrogen and progesterone receptor expression in glandular and stromal component of different categories

Spectrum	N	ER expression Mean Allred score/8		PR expression Mean Allred score/8	
		Glandular Component	Stromal Component	Glandular Component	Stromal Component
Hyperplasia without atypia	20	6.3	5.1	7.7	6.9
Atypical hyperplasia	3	5.7	3.3	4.3	3.7
Endometrial Carcinoma	2	7.0	2.0	8.0	4.0
Disordered maturation	10	5.5	3.3	7.0	4.5
Secretory/ Progesterone effect	6	4.0	4.0	1.0	1.0
Proliferative/ Estrogen effect	4	4.1	4.1	6.0	2.0
Non-secretory endometrium	1	0	0	4.0	2.0
Polyp	1	6.3	4.7	6.0	4.0
Adenomyosis	1	6.0	2.0	6.0	2.0
Leiomyoma	1	4.8	4.8	6.5	2.0
Endometritis	1	4.3	4.3	4.3	0

**Figure 1 – A. [1] Hyperplasia without atypia [2] Atypical hyperplasia [3] Endometrial carcinoma [H&E, X100] B. Estrogen receptor expression C. Progesterone receptor expression in both glandular and stromal component.**

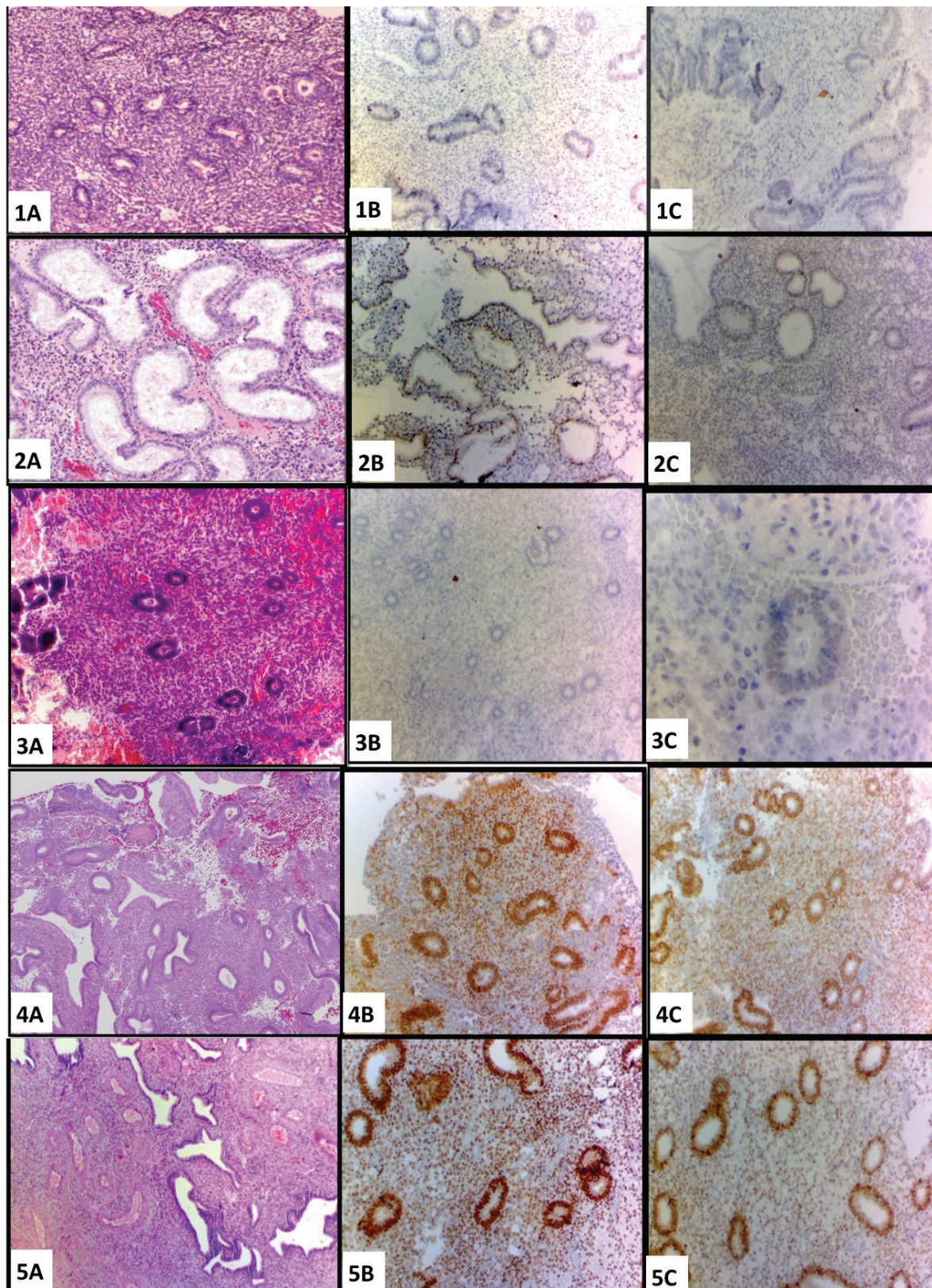


Figure 2 – A. [1] Proliferative phase [2] Secretory phase [3] Non-secretory endometrium [4] Disordered proliferation [5] Endometrial polyp [H&E, X100] B. Estrogen receptor expression C. Progesterone receptor expression in both glandular and stromal component

Discussion

The present study was conducted to evaluate endometrial estrogen and progesterone receptor expression and blood vessel density in cases of abnormal uterine bleeding. In the present study, maximum AUB cases were in the age group of 31-40 years (45.96%). The mean age of the study subjects was 39.1 ± 6.3 years (range 22-50 years). These results were in accordance with the study done by Singh P et al⁷ who revealed that cases presenting with AUB were of 36-45 years of age which accounted for 74.73%. Mean age of presentation was 37.9 years. Mostafa AM et al⁸ reported that mean age of the females of the control group was 34.81 years (range 27-40).

In the present study, among the neoplastic cases, Hyperplasia without atypia, Atypical Hyperplasia and endometrial carcinoma was reported among 80%, 12% and 8% of the subjects respectively. These results were in accordance with the study done by Baghel P et al⁹. She reported simple hyperplasia without atypia among 12 cases (5.6%), whereas with atypia was seen only in 3 cases (1.40%). The most common patterns in the present study were disordered maturation followed by Secretory/Progesterone effect and Proliferative/Oestrogen phase. These results in accordance with the study done by Tiwari A et al¹⁰ who found disordered proliferative endometrium was most common (12%) other than normal endometrial patterns.

In the present study, mean blood vessels were highest among Hyperplasia without atypia (42.60 ± 3.21) followed by polyp (38.80 ± 3.78). The least mean blood vessels was found among disordered maturation (20.17 ± 3.81) followed by endometrium in case of leiomyoma (22.36 ± 4.16). Makhija D et al¹¹ in their study revealed that the endometrial blood vessels showed characteristic changes in various phases of menstrual cycle. They were concentrated more in basal layer in the proliferative phase and were distributed more in functional layer in the secretory phase. The average blood vessels per HPF were 4.471 ± 0.095 in complex hyperplasia and 6.38 ± 0.78 in pill endometrium. Mean blood vessels per HPF were 3.9 ± 0.16 in proliferative and secretory phase and 3.73 ± 0.38 in Non secretory cases.

In the present study, overall it was observed that ER and PR expression were higher in neoplastic as compared to non-neoplastic cases. Similar results were reported by Armando A et al¹² in their study. High expression in the glandular epithelia indicates a higher sensitivity of these structures to steroid hormones, which may be responsible for the development of benign polyps in the presence of low serum estrogen levels, while malignant polyps appear to be developed by a different etiology.

In our study, there was a significant increase in ER and PR expression in the endometrial glands in patients with AUB. Patients with AUB had a significant higher endometrial thickness and ER and PR levels in the endometrium. Therefore examination of estrogen and progesterone receptor expression is more important than the biochemical examination of the hormone itself because it gives an idea about the actual effects of these hormones. Therefore, it is a useful investigation on which clinical trials could be done to try medical treatment of AUB in reproductive age group.

Conclusion

The results of the present study concluded that endometrial ER and PR expression in endometrium helped in establishing its trend in and providing insight in the pathogenesis of abnormal uterine bleeding. The examination of estrogen and progesterone receptor expression is more important than the biochemical examination of the hormone itself because it gives an idea about the actual effects of these hormones in tissues. The blood vessel density showed the possibility of quantifying microscopically the morphologic alterations that occur in blood vessels in pathological process and predict angiogenesis in AUB. However morphometric evaluation will aid to better diagnosis and treatment in cases of AUB. Therefore ER, PR expression and blood vessel density are useful investigations on which clinical trials could be done to try medical treatment of AUB in reproductive age group.

Ethical Clearance: Subharti Medical College, Meerut

Source of Funding: Self

Conflict of Interest: Nil

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Physical, Psychosocial Determinants and Quality of Life of Elderly in the Northeast of Thailand

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Abstract

Background: Rising of elderly population is one of a major public health's concerns. This research aimed to describe physical and psychosocial determinants and identify their association with Quality of Life (QOL) of the elderly population in the Northeast of Thailand.

Method: This cross-sectional study was conducted among 1,113 elderly, who aged 60 years old and older, were multistage random sampling from four provinces of the Northeast of Thailand to response to a structured questionnaire interview. Generalized linear mixed model (GLMM) was performed to identify the influence of physical and psychosocial determinants on QOL of elderly in the Northeast of Thailand.

Result: Among a total of 1,113 elderly individuals, 54.27% (95%CI: 51.29–57.22) had good QOL, follow by 45.10% (95% CI: 42.15–48.08) with moderate QOL. Factors that were associated with having good QOL among elderly population were; received highly respected as a valuable person (adj.OR= 4.23; 95%CI: 3.12-5.74), had good social support on accessibility to information (adj.OR= 3.12; 95%CI: 2.24-4.35), had no stress to minimum level of stress (adj.OR= 2.87; 95%CI: 1.92-4.27), had no physical limitation such as fall/ urinary incontinence/ constipation/ eating difficulties/ hearing/ eyesight/ mobilization/ sleeping disorders/ memory loss (adj.OR = 2.25; 95%CI: 1.66-3.06), rural residence (adj.OR= 2.00; 95%CI: 1.44-2.77), and accessibility to health care facility (adj.OR= 1.98; 95%CI: 1.48-2.70). Another significant covariate was being a younger elderly group (60-69 years old) (adj.OR= 1.84; 95%CI: 1.37-2.47).

Conclusion: Majority of elderly in the Northeast of Thailand had good QOL. Both physical and psychosocial determinants had influence on QOL the elderly population. Interventions on community to increasing respect as well as communication with elderly are essential especially for the older elderly groups.

Key words: *Elderly, Physical, Psychosocial, Quality of Life, Social Capital*

Introduction

Thailand has been entered into society since 2000-2001 with had elderly people more than 10 percent of Thai population¹ Moreover, by 2023 Thailand will get into elderly society completely by having 20 percent of population are elderly people². The Northeast of Thailand, the country's biggest region, number of elderly

people who aged 60 years and older was 3,117,763, accounting for 14.21% of the population with the ratio between elderly males and females was 1 to 1.2³. There have been various changes in term of physical, mind, and social among elderly⁴. Being in the elderly age, there are many challenges and problems from deterioration of both physical and psychological aspects which made them weak and ill. Health conditions observed among elderly were that only 3.3% of them had great health, 42.4% had good health, 38.3% had moderate health, 13.9% had poor health, and 2.1% had seriously ill health¹. Chronic non-communicable diseases have most impact on elderly especially on burden on health care and expense.

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Physical and psychological health problems are related with quality of life (QOL)². WHO defines QOL as an individual's perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns⁵. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment⁶⁻⁸. Many factors were associated with QOL among middle and elderly people including personal, political, and economical factors⁹. In addition, social interaction, dependency problem, and health problem were considered as factors influenced on QOL¹⁰. Elderly with good connection and received well support from society¹¹ had better QOL than those with poorer supports. In addition, losing social interaction could result in social deprivation¹².

At present there is no comprehensive study on the roles of physical and psychosocial determinants on QOL among elderly population especially in the Northeast of Thailand. The objective of this study describes the physical and psychosocial determinants and QOL of elderly as well as investigate the influence of physical and psychosocial determinants on QOL of elderly population in the Northeast of Thailand.

Material and Method

Study Design

This cross-sectional study was conducted among 1,113 elderly who were recruited by using a multistage random sampling from four provinces of the Northeast of Thailand including Khon Kaen, Udon Thani, Nakhon Ratchasima and Ubon Ratchathani provinces proportional to size of the population. The inclusion criteria were those aged 60-year-old and over, lived in Northeast of Thailand during the data collection. The elderly who critically ill were excluded from this study. A self-administered structured questionnaire consisted of 4 parts including demographic and socioeconomics, physical factors, psychosocial determinants, and QOL was used for data collection.

Data Analysis

A simple logistic regression was used to identify association of each independent variable with QOL. The independent factors that had p-value < 0.25 were processed to the multivariable analysis using the generalized linear mixed model (GLMM) to identify the association between physical and psychosocial determinants, and QOL when controlling the effect of other covariates, of which 4 provinces were selected to include as random effects. The magnitude of association was presented as adjusted odds ratio (adj. OR), 95% confidence interval (CI) and p-value < 0.05 as statistically significant level.

Results

Among the total of 1,113 elderly, 54% were females with the average age of 70.23 (± 7.55) old. Most of them finished primary education (88.41%), and 63.97% were married. Almost all lived with others (92%). The median monthly income was 2000 (600:50,000) Baht, of which majority relied on monthly government welfare and had not enough income. More than one-third did not work whereas more than 60% reported that they need to work.

In term of physical determinants, almost half of participants were overweight and obesity (46.35%), and 43.31% had chronic disease. The most common chronic diseases suffering they were hypertension (30.55%), and type 2 diabetes (16.62%). Almost all could perform daily functions dependently. More than a quarter having difficulties of eyesight (27.67%) followed by eating difficulties (19.68%), memory loss (19.41%), and sleeping disorder (19.04%). Concerning psychosocial determinants most of them had no and minimum stress (81.40%), and no and minimal depression (82.39%). Most of them received average to high levels of social support. Only 3.23% reflex inconvenience in travelling to health care facilities. About three quarters had family member accompanied them to health facilities, and 63.25% were satisfied with health services. More than half of the participants had good QOL, followed by fair level (Table 1).

Table 1. Number and percentage of quality of life (QOL) among participants in the Northeast of Thailand (n=1,113)

QOL Level	Number	Percent	95%CI
Poor	7	0.63	00.25 - 1.29
Fair	502	45.10	42.15 - 48.08
Good	604	54.27	51.29 - 57.22

The GLMM indicated factors associated with having good QOL among elderly population. These factors were; highly respected and admiration, had good level of accessibility to information, had no stress to minimum level of stress, had no physical difficulties (fall/ urinary incontinence/ constipation/ eating difficulties/ hearing/ eyesight/ mobilization/ sleeping disorders/ memory loss), lived in rural areas, convenience in traveling to health care facilities and younger elderly group (60-69 years old) when controlling the effect of provinces and other covariates including sex, occupation, health behaviors, chronic disease, depression, health insurance. (Table 2)

Table 2. Multivariable analysis of factors associated with good quality of life among elderly in the Northeast of Thailand, by using the GLMM model presenting odds ratios, adjusted odds ratios, 95%CI and P-value (n=1,113)

Factors	Number	% Good QOL	OR	adj.OR	95%CI	P-value
Respected and admiration by society						<0.001
Poor to fair	439	33.45	1	1		
High	674	74.82	5.91	4.23	3.12-5.74	
Accessibility to information						<0.001
Poor to average	378	29.63	1	1		
Good	735	66.94	4.81	3.12	2.24-4.35	
Stress problem						<0.001
Yes	207	26.09	1	1		
No	906	60.71	4.37	2.87	1.92-4.27	
Elderly Problems: fall/ urinary incontinence/ constipation/ eating difficulties/ hearing/ eyesight / mobilization / sleeping disorders / memory loss						<0.001
Yes	540	42.21	1	1		
No	573	63.68	2.21	2.25	1.66-3.06	
Residence						<0.001
Urban	429	45.92	1	1		
Rural	684	59.50	1.73	2.00	1.44-2.77	
Convenience in travelling to health facility						<0.001
No	458	39.08	1	1		
Yes	655	64.89	2.88	1.98	1.48-2.70	
Age (years)						
≥70	525	47.43	1	1		<0.001
60 – 69	588	60.37	1.68	1.84	1.37-2.47	

Discussion

Majority of elderly participants of this study had good QOL (54.27%). This finding is in line with the result of other studies on QOL among elderly which reported that 60.37% of primary elderly age (60-69 years old) had good QOL while 47.43% of middle elderly (70-79 years old) and lately elderly (80 and over) (47.43%) had good QOL^{13,14}. The possible reasons that could explain these situations were that the elderly aged 60-69 years old still perform normal physical functions therefore they were more likely to satisfy with their life than the older elderly who suffered physical limitations¹⁵⁻¹⁷. When the elderly had health problems, most of them were irritated and sorrowful that lead to stress therefore, caring from people surrounding them can make them feel better. This study observed that being admired and considered as valuable person were strongly associated with having good QOL among elderly in the Northeast of Thailand. It was similar with the result from other studies which expressed that supporting from society is one of the forces that had impact on QOL of the elderly^{18, 19}. In addition, elderly need supports to be able to self-reliance when having health problems²⁰. Elderly who lived in warm family with love care, respect, and help from family members made them had better life satisfaction which resulted in good QOL²¹. The context of Thailand, taking care elderly who are parents or grandparents is considered as gratitude behavior²². Therefore, the elderly was satisfied. In addition the long term care for elderly is one of an importance strategy of the Ministry of Public Health Thailand, in the preparation to be readiness for the elderly society, involving collaboration of various sectors of society^{18,23}. Supporting elderly to access the information in their societies had influenced on their QOL as well. Elderly who could access to information have better opportunity to access to public welfare, joining events as well as health care, minimized misunderstanding on information which have impact to both their physical and psycho social health²⁴. In addition power of information could make them have more confidence in travelling to various places as well as health facility¹⁸. No and minimal levels were associated with having good QOL of elderly people. This result was supported by previous studied which stated that having good mood had effect on elderly mind¹⁵ and mental health is main factor that had impact on elderly's QOL^{25,26}

The Northeast of Thailand is the region that the working age population migrated to work in Bangkok and other regions sending money home for their parents. Many elderlies had children who were working in various urban settings to earn money to support family especially their parent who mostly lived in rural areas. The elderly who lived in rural settings with the support from the other family members and communities as well as lifestyle and culture of caring and sharing could enjoy their life better than those lived in urban settings resulted in better QOL¹⁸.

Conclusion

More than half of elderly population in the Northeast of Thailand had good QOL. Both physical and psychosocial determinants were associated with QOL among these elderly population. Social interventions to improve respect as well as communication with elderly are essential especially for older elderly group.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE612119.

Source of Funding- Self-funding.

Conflict of Interest- Without.

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Assessing the Awareness of Usage of Mouth Washes among the General Population and Patients Undergoing Orthodontic Treatment-A Questionnaire Study

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Abstract

Introduction: Usage of mouthwashes and its different variants is on the rise due to their ease of use and simplicity as well as the relative comfort it gives the user on maintaining oral hygiene. However this must be balanced with the understanding that mouthwashes are merely adjunctive aids for maintaining oral hygiene and must be balanced with proper brushing and flossing to express its full effects. This study aims to assess the awareness of usage of mouthwashes among the general population and patients undergoing orthodontic treatment and attempts to differentiate between different needs for usage of mouthwashes.

Materials and Methodology: A questionnaire survey containing 16 questions was prepared which contained questions regarding the information about the subject and their knowledge about the usage of mouthwashes, its types, uses and side-effects. The questionnaire was prepared using Google forms and was sent to 149 subjects through mail and by sharing the link of the survey. The subjects included patients from varied age groups as well as the general population and patients undergoing active orthodontic treatment

Results and Conclusion; Most of the subjects who took the test and were using mouthwashes as a part of daily oral hygiene were aware of its usage patterns and conditions. The main reason for using mouthwashes was bad breath followed by prevention of dental caries. Awareness in gargling time, different conditions was higher in orthodontic patients as well as increased care towards their oral hygiene

Keywords: Mouthwashes, General population, Orthodontic treatment, Knowledge

Introduction

As the old saying goes, The oral cavity is the mirror to a person's health. Maintaining good oral hygiene involves adequate brushing with a proper technique and flossing in the interdental regions to remove food debris and plaque⁽¹⁾

Dental health awareness should be stated at a very young age. Children should be taught the importance of

keeping their teeth healthy and clean^(2, 3). Consequences of poor oral hygiene and poor food choices should be explained to effectively remind the children of the need to brush their teeth after every meal and avoid sweet treats as much as possible⁽⁴⁾.

In adults, the dental health awareness should be assessed by their dentists. Awareness about dental health will help them in understanding what practices should they need to reinforce to have a healthy and strong teeth⁽⁵⁾. Different dental treatments are now made available to cosmetically enhance the appearance of teeth, correct orthodontic problems as well as in restoring teeth. Alleviating fear or anxiety related to lack of knowledge regarding the procedure is one of the mitigating factors and this must be resolved as soon as possible⁽⁶⁾.

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A mouthwash or rinse does not replace a regular and proper oral hygiene routine of twice-daily tooth brushing and daily flossing. The main function of most mouthwashes is to freshen breath and that said, some mouthwashes such as fluoride rinses, can help protect the teeth from decay by shielding them from acids produced by plaque bacteria ⁽⁷⁾. Patients undergoing orthodontic treatment, might have an increased concern and awareness about the status of their teeth and appearance and it would be interesting to note their viewpoints towards usage of mouthwashes, both from a social as well as commercial point of view⁽⁸⁾. This study aims in instilling such dental awareness over the use of mouthwashes among adults in the general population as well as patients undergoing orthodontic treatment.

Materials and Methodology

This is a knowledge aptitude practice survey assessing the awareness of general population and patients undergoing orthodontic treatment towards the usage of mouthwashes. The survey was prepared using Google forms and was sent to the participants using the web link of the survey. 149 subjects were included in this study. The survey consisted of sixteen questions out of which 4 were compulsory and 13 were not compulsory. Out of the 149 subjects, 64 were patients undergoing orthodontic treatment and the remaining 85 were from the general population and included varied groups. Since this test was used to check the awareness of mouthwashes among people, subjects who had relatives or friends undergoing orthodontic treatment could also answer questions regarding the usage of braces and its comfort levels.

Results

1) Do you use mouthwashes?

150 responses

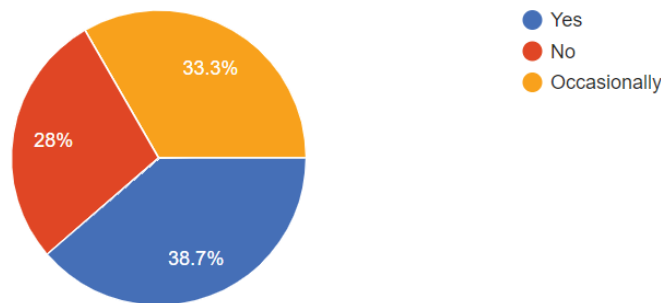


Figure 1: Assessment of usage of mouthwashes

2) Have you used any mouthwash for the below listed conditions?

144 responses

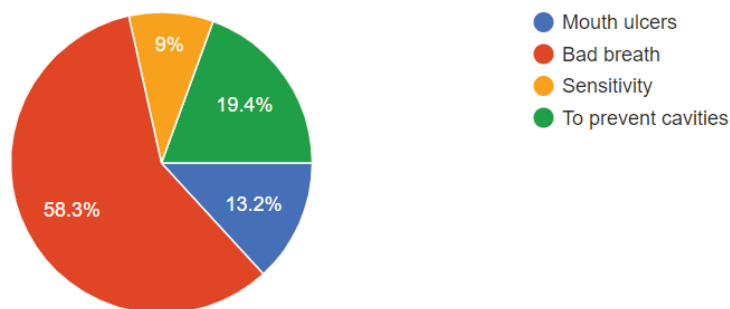


Figure 2: Content-driven mouthwash use(contd)

3) Are you aware of the need for mouthwashes during orthodontic treatment?

129 responses

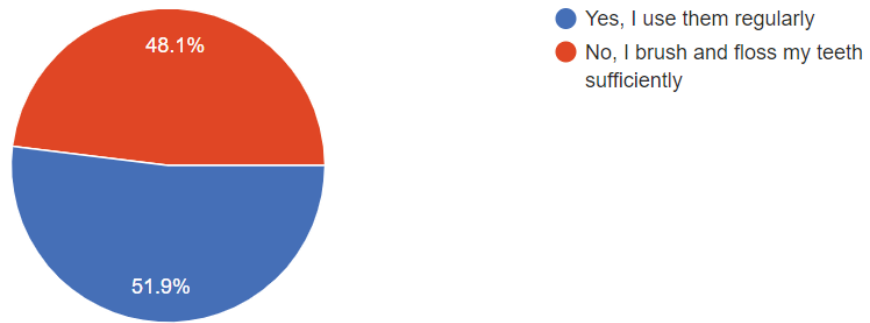


Figure 3: Adjunct with orthodontic treatment

4) Are you aware of the side-effects of improper oral hygiene during orthodontic treatment?

110 responses

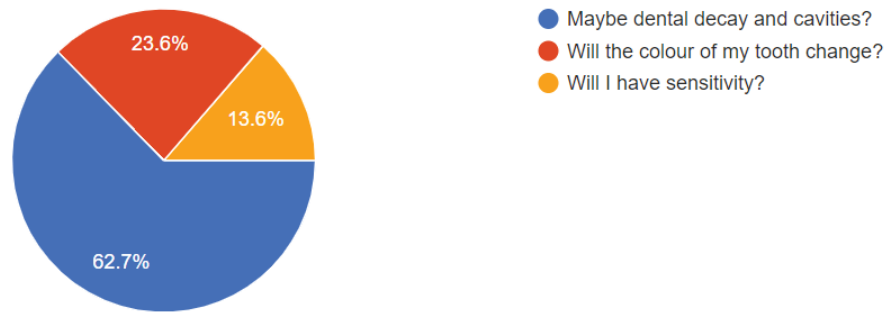


Figure 4: Possible side-effects

5) If yes, then are you aware of

130 responses

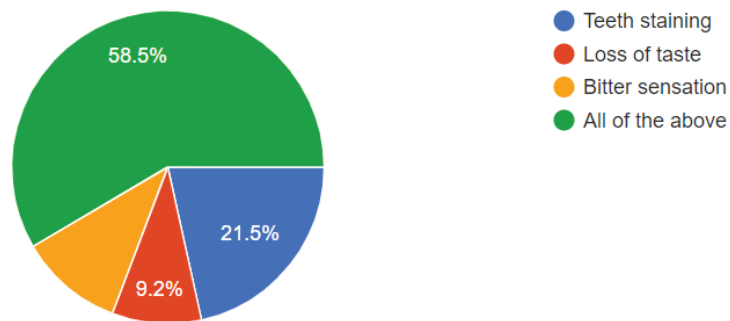


Figure 5: Possible side-effects(contd)

6) Are you aware that usage of tea, coffee, and other beverages must be restricted when using anti-plaque mouthwashes?

150 responses

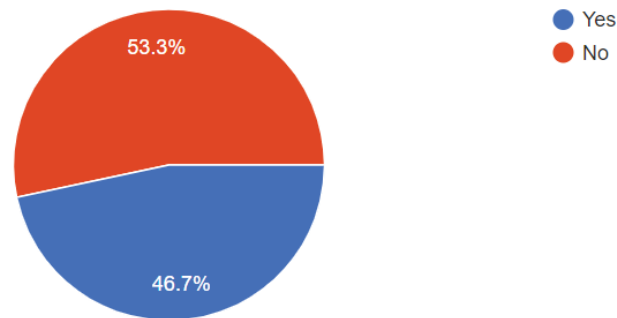


Figure 6: Dietary restrictions

Discussion

The questions were framed in such a way that the initial few questions inquired about the usage of mouthwashes and the subsequent reasons for either using or not using it. Since this survey focused on assessing the awareness regarding mouthwashes, people who did not use mouthwashes too could participate in the survey by answering the other questions. The questions then gradually moved towards assessing the knowledge of subjects in using mouthwashes and the time required to gargle, expectorate etc. The interest of subjects towards their oral hygiene was assessed with some aptitude questions along with a little medical history and then the survey finally moved towards assessing the beneficial effects as well as a few side-effects a few 'must-knows'.

The first question was framed to determine the number of subjects using mouthwashes. 38.9% of the subjects replied yes and 28.2% replied no while 32.9% replied occasionally⁽⁹⁾. The second and third questions focused on why the subjects were either using or not using mouthwashes. 63.7% of the subjects replying no mentioned that they were taking care of their oral hygiene regularly which was a satisfying number. 21.6% saw no need in using mouthwashes while 7.8% considered it to be expensive for daily needs and 6.9% were not aware of mouthwashes and other adjunctive oral hygiene aids which despite being a small number does not portray favorably^(10,11). In patients replying in the affirmative for

usage of mouthwashes, the main reason for using them was for eliminating bad breath as 52.4% would attest to. 35.2% considered it as a part of daily oral health care and hygiene which despite being an encouraging number needs further improvement⁽¹²⁾. 6.7% used it for reducing dental decay and 5.7% used it for cosmetic reasons such as teeth whitening. In the fourth question, 44.2% of the subjects replied that they had used a mouthwash with a doctor's prescription while the remaining 55.8% did not which could also imply that they were not too fond of mouthwashes as well as the fact that they were not active participants in maintaining good oral hygiene⁽¹³⁾. In the fifth question, the awareness towards the ingredients and contents of the mouthwash as well as in using it was questioned with 58.9% replying that they read the instructions given in the label of the mouthwash^(14,15). 25.5% were not too fond of strictly complying with conditions and used it for gargling after brushing. This indicated poor awareness towards compliance methods and also indicated a slight slack in reading instructions and complying to protocol and procedures⁽¹⁶⁾. 15.6% used mouthwashes to their own wishes and did not strictly adhere to any specific timing with convenience being their chief concern. It is important to read the label on any brand of mouthwash. Different brands have different concentrations, and some may recommend dilution with water⁽¹⁷⁾. If the label does not tell you to dilute, then the full benefit of the mouthwash may not be expressed if the ingredients are at a lower level. One

of the keys to using mouthwash correctly is to swish it in your mouth for the correct amount of time⁽¹⁸⁾. Read the product label. Most mouthwashes recommend that you swish the product around in your mouth for 30 seconds to one minute then spit it out. The sixth question focused on whether the subjects read the contents of the mouthwash properly. 72.6% replied yes while 27.4 % replied no. The seventh question lists the conditions for using mouthwashes and bad breath (halitosis) leads the list with 58%. The next condition in the list is preventing dental caries with 19.6%. Fluoride mouth rinses are mostly given for preventing dental caries. Mouth ulcers constitute 13.3% while sensitivity contributes to 9.1%. The eighth question deals with the number of times mouthwash is used in a day. 41.3% use it only once in the morning, while 31.5% use it irregularly and 27.3% use mouthwashes twice a day. The ninth question deals with awareness about different conditions for which mouthwashes can be used. 58.4% replied yes while 41.6% replied no. The absence of an overwhelming majority in this condition is a cause of concern as it indicates lack of awareness about the indications for using a mouthwash and is mostly used as a fad or routine in most cases. The tenth question deals with patients undergoing orthodontic treatment and attempts to understand their opinion on usage of mouthwashes during active appliance therapy. 51.6% replied yes while 48.4% replied no. The lack of a big difference between both the answers is slightly misleading since it could also indicate ignorance on part of the patient or lack of education on part of the orthodontist⁽¹⁹⁾. At any case, mouthwashes are not a must in orthodontic treatment with fluoride rinses being the most commonly prescribed mouthwashes. The eleventh question is revealing on part of the patients for using mouthwashes. 50% of patients have voted for reducing foul odour and freshening up breath with oral hygiene and appearance being the chief concern. 28.3% have answered with maintenance of oral hygiene being easier since it can remove food debris and plaque and prevent accumulation of bacterial load. 15.1% have replied with preventing dental decay⁽²⁰⁾. This could be put down to either awareness about the composition of the mouthwashes they are using which is a positive sign or sheer mental training about the treatment from the part of the orthodontist. 6.6% have replied with mouthwashes giving a psychological effect which could be explained as the placebo therapy. The

twelfth question tries to gain an insight into the patients self awareness about his treatment pattern as well as oral hygiene awareness. 62.4% replied with dental decay and cavities which was a positive sign while 23.9% were concerned with the damaging effects to their teeth and appearance while 13.8% were concerned about its effects to the functioning of the oral cavity with sensitivity being a chief complaint⁽²¹⁾. The thirteenth question asks about the side effects of mouthwashes with 51.7% replying yes and 37.6% replying no which is a damaging number. People who were aware of its side effects were however quite knowledgeable with respect to its signs and were conscious of the limitations of mouthwashes⁽²²⁾. The final question attempts to reveal the mindset of positively-motivated people in using mouthwashes with 50.7% replying with bad breath indicating that halitosis and oral hygiene maintenance awareness is still not up to required standards in most of the population and greater efforts are required to instill a greater sense of awareness among the general population as well as patients undergoing orthodontic treatment.

Conclusion

Orthodontic treatment is widely acknowledged and accepted in everyday dental practice due to the positive effects it has on the dentofacial complex^(3, 4). With fixed orthodontic appliances, clinicians can offer patients the establishment of functional occlusion, improvement of oral health, and esthetic improvement of the dentofacial complex. Anomalies in the development of the face and jaws as well as orthodontic treatment can influence oral health⁽⁷⁾. Deviations from an ideal arrangement and position of teeth (lack of space, tooth rotation or open bite, a deep bite, and cross-bite) facilitate dental plaque accumulation⁽⁸⁾. It has to be pointed out that malocclusion is not a primary etiological factor but an auxiliary factor, which facilitates dental plaque accumulation. The main principle of orthodontic therapy is to correct tooth and jaw position and, thus, indirectly improve the health of the periodontium and durability of teeth⁽¹⁰⁾.

There is a need to incorporate more oral hygiene programs in future. Extra attention should be given in educating and motivating the patients on oral hygiene practices during orthodontic treatment in a proper manner and this could be beneficial in maintaining proper oral hygiene⁽³⁾. Maintaining good oral hygiene

procedures during fixed appliance therapy is important for gingival health and to prevent the development of white spot lesions ⁽⁶⁾. Mouthwashes can only control plaque if the brushing technique employed is efficient. In this study, 28% of males and 52% of females use mouthwash, which has a combined value of 40%. This value is close to a research done by Baheti and Toshniwal, ^[8] in which 57.4% of the population used mouthwash. In the same research, 36% of people used mouthwash after every meal, which is in contrast to our research with 12%. From the above study, it is clearly understood that women understand the usage of mouthwash better compared to men.

All procedures carried out with hydrogen peroxide in the mouth with the purpose of whitening the teeth should be performed directly by a dentist who has been properly trained to prevent the oral mucosa from receiving this product during the procedure ⁽⁷⁾. The time and method of use require caution in order to decrease, to the minimum, the undesirable effects of hydrogen peroxide on tooth tissues and restorations. Whitening strips and other tooth bleaching products are all hydrogen peroxide-based. Should mouth washing with hydrogen peroxide be occasionally done, touching the oral mucosa once a year or every six months, it would cause minor co carcinogenic effects ^(10, 12). However, should it be done every day or every week, as an antiseptic used to help with oral hygiene, it would become a protocol that is highly reckless to health! Websites, blogs and social network profiles that recommend the procedure should be immediately sued by the government! Esthetics comprises harmony between shape, size, position and color ⁽¹⁴⁾. If we take a closer look at some people's smile and notice red gingival and lips with extremely white teeth, the diagnosis of excessive use of hydrogen peroxide is inevitable: artificiality is evident. Extremely white teeth and red gingival and lips create a quite artificial picture from an esthetic standpoint!

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The questionnaire survey was circulated through electronic medium with the help of Google forms. The survey was sent among orthodontists as well as general dentists

Competing Interests: No competing interests were applicable in this manuscript

Funding: Not applicable

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Morphological Variations in the Branching Pattern of Left Coronary Artery in Adult Human Hearts using Silicon Cast Method

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Abstract

The knowledge of variations in the branching pattern of Left Coronary artery is an important factor in the study of coronary heart disease and mostly it is the left which is commonly involved. With the adaptation of sedentary life style and increasing stress, Coronary artery disease has become the major cause of death and coronary angiography is has become a routine for cardiologists & radiologists. This study is done to determine the branching pattern, mean length and mean outer diameter of the trunk of the Left Coronary artery using Silicon Cast technique. A Plastinate material that is Silicon is used in this study for luminal casts, this is first of its kind in India and it's a new innovative technique for studying the arterial patterns. The present study was carried out in 110 fresh hearts, 90 males and 20 females with a mean age of 66.0 years, which were collected from the mortuary of the Forensic department of Mysore Medical College and JSS Medical College, Mysore, South India for a period of 2 years. The Silicone material was injected into the Coronary arteries; the cast was removed and the fine branching pattern of the left Coronary artery was studied and measured using Vernier digital calipers. The left Coronary artery arose from the left posterior aortic sinus in most number of cases. The mean outer diameter of the trunk at the point of origin was 3.51 ± 0.71 (range 2 – 5.8mm). The mean length of the trunk of left Coronary artery was 10.04 ± 3.27 mm (range 4-18.5mm). Most of the branching pattern was bifurcation (62.72 %) and trifurcation (33.63%) was observed, tetrafurcation was found to be in 3.63% of cases only, no cases of pentafurcation was seen .This study will help in interventional studies by cardiologist and radiologists during diagnostic and therapeutic approach in Coronary vascular diseases.

Key words: Heart vessels, Left Coronary artery, Silicon cast, Vascular pattern.

Introduction

The Human heart is supplied by the Coronary arteries. The right and left Coronary arteries arise

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from the aortic sinus of Valsalva, the right arises from the anterior aortic sinus and the left from the left posterior aortic sinus, the right posterior aortic sinus is devoid of any orifice hence, known as non-coronary sinus ¹. The Left Coronary artery (LCA) has a wide range of morphological variability with respect to its diameter, length and branching pattern of its main trunk. Normally, the LCA after arising from the left posterior aortic sinus of ascending aorta, it passes between the pulmonary trunk & left auricle, where it divides into two branches: the Left anterior descending branch (LAD) and Left circumflex branches (LCx). In 2% of cases these two branches may arise separately from the

same sinus. Furthermore, the LAD branch gives left diagonal, left conus and septal branches. The circumflex gives atrio-ventricular, sinuatrial nodal, left marginal and posterior interventricular artery and Kugel's artery². Many angiographic studies have been done in the previous literature showing considerable variations in the branching pattern of LCA in different populations & races. But even the angiographic measurements of LCA was found to be less accurate than those seen in post-mortem pathologic studies, due to their under estimation by the effects of rotation angulation and foreshortening³. A correlation between the branching pattern of Left coronary artery and atherosclerosis present in its branches or the presence of a complete left bundle branch block has been noted⁴. Variations of the branching pattern of Left coronary artery has been studied by various previous authors, its branches showing bifurcation, trifurcation, tetrafurcation and pentafurcation has been noted among various populations. With the recent changes in the life style and increased stress among the South Indian population, coronary heart diseases are on the high rise, a number of therapeutic procedures like angiography and coronary by-pass surgeries are being done on day to day basis in every hospital, therefore our study aims at identifying the vascular pattern of Left coronary artery using Silicon casts among the South Indian population. Such a study of the vascular pattern of Coronary arteries using Plastination technique like Luminal Silicon casts has been done for the first time in India.

Materials and Method

A total of 110 adult cadaveric normal human hearts were collected 90 males (82%) and 20 females (18%) with average mean age of 66 years. The hearts were obtained from the mortuary from the department of Forensic medicine of JSSMC & MMCRI, Mysuru, South India for a period of 2 years. There was no history & evidence of cardiovascular diseases. Ethical clearance was granted by the Institutional Ethical Committee of JSSMC.

Dissection method: The arch of aorta was identified and about 15cms above the sinutubular junction it was

incised transversely, the three sinuses were identified, a vertical incision was made along the tubular wall of non-coronary sinus for clear visualization of the coronary ostia.

Silicon cast method: The Silicone gel was used as Plastinate material and was injected using a gun under controlled pressure into the Left Coronary artery ostia; the heart was then put in HCl Solution for the cardiac muscle to get corroded and the cast was removed carefully. The Silicon cast was left to dry and measurements were taken. The diameter and length of the trunk of Left coronary artery was measured using digital Vernier calipers and noted. Variations in the branching pattern like bifurcation, trifurcation, tetrafurcation and pentafurcation of the main trunk of left coronary artery were noted in the Silicon casts.

Statistical analysis was done using SPSS software. Means and standard deviations were done for continuous variables and nominal variables were described in terms of percentages.

Results

The Aortic valves in all 110 specimens were normal and had three cusps.

Mean diameter of the trunk of LCA: The mean diameter of LCA was 3.51mm (range 2 – 5.8mm).

Mean length of the main trunk of LCA: The mean length was 10.04 mm (range 4 – 18.5 mm).

Branching pattern of LCA: Bifurcation was seen in 62.72 % (69/110); Trifurcation in 33.63 % (37/110), Tetrafurcation in 3.63% (4/110), No cases of pentafurcation were seen.

(Refer Table no: 2) (Refer Figures no: 1 & 2)

Small & Long length of main trunk of LCA: The percentage of small trunk length (less than 5mm) was 5.45% and of long trunk length (more than 15mm) was found to be 7.27%.

TABLE No: 1: Comparison of the mean diameter and mean length of the common trunk of the Left coronary artery with previous studies:

Authors/Studies.	Mean diameter of trunk (mm) of LCA.	Mean length of trunk (mm) of LCA.
Priti,et al 9	-	11.42 ± 4.98
Reig & Petit5	-	10 ± 5.52
Venkateshwer,et al 7	2 - 6	15 - 25
Anil Kumar,et al 6	4.34 ± 2.01	10.2 ± 3.5
Kalpana,et al 10	-	6 - 15
Kulkarni,et al 11	-	7
Present study	3.51 ± 0.71	10.04 ± 3.27

TABLE No: 2: Variations in the branching pattern of LCA using Silicon casts:

Branching pattern (n=110)	Percentage (%)
Bifurcation	62.72
Trifurcation	33.63
Tetrafurcation	3.63
Pentafurcation	-

TABLE No: 3: Comparison of the branching pattern of Left Coronary artery in the previous studies:

Studies	No. of cases	Method used	Bifurcation (%)	Trifurcation (%)	Tetrafurcation (%)	Pentafurcation (%)
Calvacanti et al 14, 1995	100	Dissection	47	40	11	01
Kalbfleisch et al 13, 1977	141	Angiography	51.1	44.4	4.3	-
Kulkarni et al11, 2013	60	Dissection	60	35	05	-
Sanchita et al 15, 2014	98	Dissection	56	40	02	-
Reddy & Pusala 16, 2016	110	Dissection	86	14	-	-
Sultana Ruma Alam 17, 2017	50	Dissection	74	26	-	-
Lakshmiprabha et al 12, 2018	55	Dissection	54.54	41.82	1.82	-
Anil et al 6, 2018	78	Dissection	80.7	10.2	7.69	1.28
Present study	110	Silicon casts	62.72	33.63	3.63	-

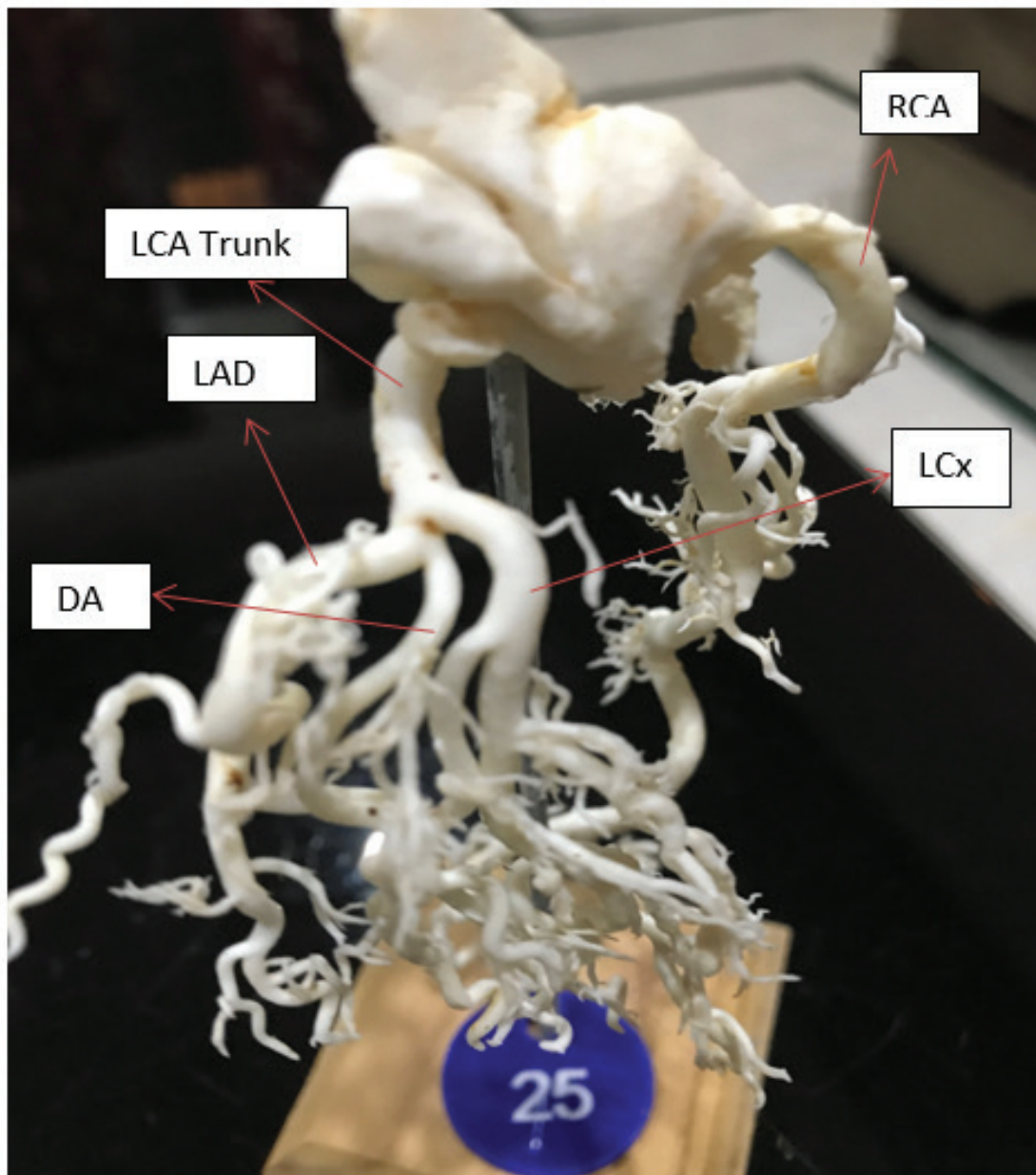


FIGURE No: 1 : Branching pattern of Left Coronary artery showing Trifurcation.

LCA: Left coronary artery; RCA: Right coronary artery; LAD: Left anterior descending artery;

LCx: Left Circumflex branch; DA: Diagonal artery/branch.

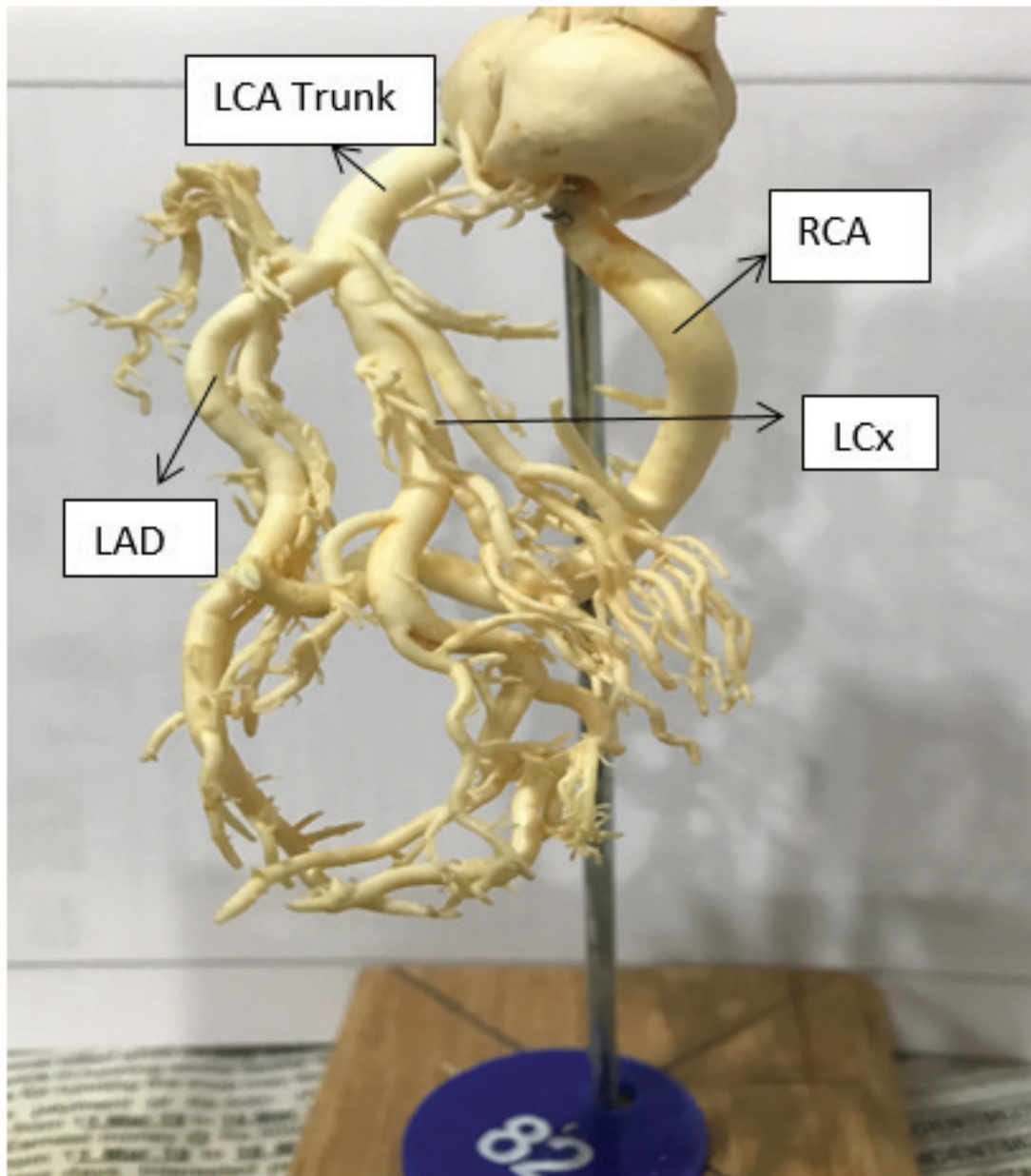


FIGURE No: 2: Branching pattern of Left coronary artery showing Bifurcation.

LCA: Left coronary artery; RCA: Right coronary artery; LAD: Left anterior descending artery; LCx: Left Circumflex branch.

Units of measurement: mm;

Abbreviations: LCA: Left coronary artery; RCA: Right coronary artery; LAD: Left anterior descending artery; LCx: Left Circumflex branch; DA: Diagonal artery.

Discussion

The Coronary artery disease is one of the major causes of death among the urban population of South India. The main trunk of the LCA usually does not give any branches but terminates into a left anterior descending artery (LAD) and a left circumflex artery (LCx). There were no variations with regards to the origin of the LCA from the Aortic sinus in our study. Reig & Petit revealed the average length of the main trunk of LCA to be 10 ± 5.52 mm (range 2 – 23mm)

⁵. Anil Kumar et al reported in his study conducted in 78 cadaveric hearts the mean diameter of trunk of LCA as $4.34\text{mm} \pm 2.01\text{mm}$ and the mean length as $10.2 \pm 3.5\text{mm}$ ⁶. Venkateshwer et al reported among 110 cadaveric hearts of South Indian population the diameter of the trunk of LCA to be 2 – 6mm and the length to be 15 – 25mm ⁷. In our study the mean diameter of the trunk of LCA was found to be $3.51 \pm 0.71\text{mm}$ (range 2 – 5.8mm) and the mean length of the trunk of LCA was $10.04 \pm 3.27\text{mm}$ (range 4 – 18.5mm) (Refer Table no:1). Gazetopoulos et al showed a relationship between the lengths of the main trunk to the degree of atherosclerosis in its branches. He reported that in shorter trunks of LCA, the atherosclerotic lesions appeared early and progressed faster at the higher levels of severity and can cause myocardial infarction more frequently than in the cases of longer length of the trunks ⁴. The length of the trunks is also very important in the positioning of the cannulas during aortic valve surgeries & during myocardial perfusion. Studies conducted by Bhele et al showed that when the length of the common trunk of LCA is less than 5mm then it can be considered as short and if it is more than 15mm then it can be considered as long common trunk ⁸. In our study the percentage of short trunks (less than 5mm) was 5.45% and percentage of long trunks (more than 15mm) was 7.27%. Priti et al reported the mean length of LCA to be $11.42 \pm 4.98\text{mm}$ (range 0.5 – 21.5mm) in 60 cadaveric hearts among North Indian population ⁹. Kalpana et al reported the mean length of the main trunk of LCA to be between 6 – 15mm ¹⁰. Studies by Kulkarni et al revealed the mean length of the trunk to be 7mm (range 5 – 10mm). The LCA was bifurcated in 60% cases, trifurcated in 35% and tetrafurcated in 5% cases ¹¹. Previous studies have shown morphological variability in the branching pattern of LCA. The most common type of branching pattern of LCA reported was bifurcation. In our study also bifurcation type of branching pattern was the commonest followed by trifurcation & tetrafurcation (Refer Table no:3). There was comparatively lower incidence of tetrafurcation in our study (3.63%). The incidence of tetrafurcation in the literature ranges between 2.5 – 11%. The occurrences of pentafurcation of LCA was not well documented. In our study also cases of pentafurcation were not found. Lakshmiprabha et al conducted study on 55 cadaveric hearts by dissection method among South Indian population, the LCA was bifurcating in 54.54%,

trifurcated in 41.82% and tetrafurcated or pentafurcated in only 1.82% cases ¹². Our findings are very similar to the studies conducted by Kulkarni et al ¹¹, in our present study the LCA was bifurcated in 62.72 %, trifurcated in 33.63 % and tetrafurcated in only 3.63 %, no cases of Pentafurcation was found (Refer Table no: 2 & 3) (Refer Figure no: 1 & 2). The LCA is the major source of blood supply to the heart. Kalbfleisch & Hort conducted study on the regions irrigated by the Coronary arteries using postmortem angiography which showed that 68.8% of cardiac muscle mass is irrigated by LCA and 79% of the left ventricular muscle mass. Therefore, any obstruction in the LCA & its branches reduces blood flow to the ventricular myocardium leading to atherosclerotic disease; this has more serious complications than those of the Right Coronary artery ¹³.

Conclusion

Due to high rise in the cases of Coronary artery disease in south India it's very important to know the branching pattern of Left Coronary artery for early diagnosis & treatment. Therapeutic procedures like angiography & by-pass surgeries requires sound anatomical knowledge with respect to the branching pattern of the coronary arteries, this can diminish many technical complications during catheterization and prevent false interpretations of the angiograms of coronary arteries by the radiologists and cardiac surgeons. In the present study exploring the coronary arterial pattern with the use of Silicon casts is first of its kind in India. Such an innovative method can be used to study the arterial pattern of various other viscera and can be useful for future studies by the researchers.

Acknowledgement: I wish to thank my Institution for allowing me to publish my original research article. I thank my guide & Principal Dr. H. Basavanagowdappa, JSSAHER, for his constant encouragement. I thank Dr. Madhu, Deputy Director Research, JSSAHER, for her immense support. I also wish to thank my HOD, Dr. Pushpalatha.K, JSSMC, for her kind support.

Ethical Clearance was taken by the JSSAHER Institutional Ethical committee for the project.

Source of Funding was by the JSS Academy of Higher Education & Research, Mysore, India.

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Post-Menopausal Sex Hormones in Relation to Type 2 Diabetes Mellitus

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Abstract

Sex Hormone binding globulin is a glyco protein that transports the sex steroids to their target tissue. The concentration of free steroids in the circulation depends upon the availability of serum SHBG. Low SHBG is associated with hyperinsulinemia, T2DM, and cardiovascular risk. **Objective:** The objective of the study was to determine the correlation of SHBG with hormone levels, insulin and BMI in post- menopausal women with type 2 diabetes mellitus (T2DM). **Research Design and methods:** One hundred and five postmenopausal women with diabetes and eighty five postmenopausal women without diabetes were recruited for the study. Height, weight, BMI, was measured. Insulin, SHBG and sex steroids were measured by enzyme linked immunosorbent assay (ELISA). **Results:** The mean concentration of SHBG was higher in control group 25.21 (16.1- 43.7), than the diabetic postmenopausal women 20.65 (12.54-33.46) $p < 0.05$. A significant inverse association was observed between insulin resistance, free testosterone and BMI. **Conclusion:** In postmenopausal women with type 2 diabetes mellitus low levels of SHBG is observed which shows an inverse correlation with insulin resistance, free testosterone and DHEA leading to hyperandrogenicity and hyperinsulinemia .

Key words: SHBG, Estradiol, Testosterone, DHEA, Post- Menopausal women, Diabetes Mellitus.

Introduction

Women experience abrupt hormonal changes, mainly the reduction in the level of endogenous Estrodiol and relative excess of androgen during menopausal transition. These hormonal changes increase the prevalence of metabolic syndrome in post-menopausal women when compared with a woman of fertile age ¹⁻³. Insulin resistance characterised by abnormal glucose, obesity and dyslipidaemia ⁴⁻⁷ marks the origin of metabolic syndrome ⁴⁻⁷. Sex Hormones and their transport protein known as Sex Hormone Binding Globulin possess a major role in the pathophysiology of T2DM ⁸.

SHBG is a carrier protein for sex steroids mainly estrogen and testosterone regulating its bioavailability in the circulation. Reduced level of SHBG and its relation with T2DM and metabolic syndrome have been demonstrated by some of the epidemiological studies ^{9, 10}. However, studies on the role about the sex hormones in postmenopausal women with T2DM is limited. Therefore the current study aimed to correlate SHBG with sex hormones in post- menopausal population with T2DM. We hypothesized that reduced SHBG may contribute to the pathogenesis of T2DM in postmenopausal women in relation to sex hormones by modulating the sex steroids.

Methodology

This case control study was performed on 105 postmenopausal women with previous history of diabetes aged 45-65 years, recruited from the outpatient department of K.S.Hegde Charitable Hospital,

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Mangalore. 85 healthy non –diabetic postmenopausal women served as control .Subjects with thyroid disorder, liver and renal disease were excluded from the study.

The study protocol was approved by the Central Ethics of Nitte Deemed to be university. Informed consent was obtained from all the recruited subjects after explaining the nature and purpose of the study.

Anthropometric Measurement: Body height and weight were measured. BMI was calculated as weight in kilograms (kg) divided by height in meters squared (m²)

Biochemical Analysis: Fasting venous blood were collected from each subject after 12 hours fast using plain tubes which was then centrifuged for serum. The separated serum from each sample was divided into two separate tubes. Serum was stored at -20 centigrade for the analysis of testosterone, estrodiol, SHBG, DHEA and insulin. Glucose and lipid profile were analysed immediately after sample collection.

Plasma blood sugar, triglyceride(TG) and HDL-CHO were measured by Semi automated biochemistry analyser(Star 2 plus). SHBG, insulin and sex-hormones was analysed by ELISA (Diamitra,Italy).

Insulin resistance were calculated using homeostasis model assessment (HOMA-IR). Free testosterone was calculated from serum total testosterone and SHBG using an online calculator.

Statistical analysis: All the analysis were performed using SPSS version 12. For a Normally distributed data, descriptive statistics were used and reported as Mean + Standard deviation. Otherwise the reports are expressed as Median (25th, 75th) percentile. Association of SHBG with insulin and other metabolic variables were assessed with Spearman’s correlation.

P-value < 0.05 was considered statistically significance.

Results

Descriptive Characteristic

Table 1 presents descriptive statistics between the case and control subjects. Among the postmenopausal women, diabetic (case)group had significantly higher fasting blood sugar, insulin, BMI when compared with a control subjects. Cholestrol, Triglycerides, LDL-C was increased and HDL-C was decreased in postmenopausal diabetic women.

Table 1:Baseline characteristics of the post-menopausal women with and without diabetes

	Case (n=105)	Control(n=85)	p - Value
Age (years)	59 (54,3)	54 (51,57)	<0.001
Weight (Kg)	59.9 +12.5	56.0 + 10.4	<0.001
BMI (wt in kg/ ht in m2)	26.32 + 5.21	24.1 + 3.93	<0.001
FPG (mg/dl)	142(122,175)	99 (89,106)	<0.001
Insulin	21.4(3.02, 30.9)	3.74(1.77, 7.70)	<0.001
Homa ir	7.67(0.83, 14.3)	1.0 (0.42, 1.80)	<0.001
Cholestrol	159 (138,189)	148 (123, 174)	
Triglyceride	125 (95,162)	118 (94, 150)	
HDL -C	43 (36,51)	51 (42 , 58)	
LDL-C	93(72,145)	74 (54, 95)	
VLDL-C	26 (20 , 32)	23 (18 ,31)	

Results are presented as mean + SD for data that were normally distributed median[2th,75th percentile] for non-normally distributed data. BMI,body mass index;FPG fasting plasma glucose; Homa-IR, homeostasis model assessment for insulin resistance.

SHBG and Sex steroids

The steroid hormone and SHBG data are listed in Table 2. SHBG concentration differed markedly between the groups, with significantly lower levels (median 20.65 nmol/L) in diabetic postmenopausal

women than healthy (25.21 nmol/L) control women. (Table 2). Total testosterone and free testosterone were higher in case group but it was not significantly different. Dehydroepiandrosterone (DHEA) was significantly raised in case subjects (1.50 ng/ml) when compared with control post-menopausal women.

Table 2: SHBG and Hormone levels between the groups

Hormones	Case	Control	p-value
SHBG(nmol/l)	20.65 (12.54, 33.46)	25.21 (16.1, 43.7)	<0.05
Testosterone (nmol/l)	1.11 (0.45, 1.62)	0.90 (0.47, 1.61)	NS
Estradiol(nmol/l)	0.276 (0.08, 0.35)	0.29 (0.17, 0.39)	NS
DHEA (ng/ml)	1.50 (0.45, 1.60)	1.09 (1.03, 1.95)	<0.01
Free Testosterone	0.0245 (0.011, 0.03)	0.016 (0.15, 0.67)	NS

SHBG, sex hormone binding globulin; DHEA, Dehydroepiandrosterone.

Correlation between SHBG and the hormones

SHBG was significantly inversely correlated with fasting blood glucose, body mass index, insulin resistance, free testosterone and DHEA among women with Type 2 Diabetes (Table 3). No association was observed in healthy control postmenopausal women (data not shown). SHBG was positively correlated with testosterone and estradiol which was not significant.

Table 3: Correlation between SHBG with Blood glucose, Insulin, Homa-IR and Sex Steroids in postmenopausal diabetic women.

	Spearman Correlation	p-value
FBG	-0.297	0.002
BMI	-0.26	0.006
HOMA-IR	-0.223	0.04
Testosterone	0.051	NS
Free Testosterone	-0.320	0.001
Estradiol	0.103	NS
DHEA	-0.291	0.03
Cholesterol	-0.154	NS
Triglyceride	-0.166	NS
HDL-C	0.040	NS
LDL-C	-0.173	NS

Discussion

We evaluated the association of SHBG with sex steroids in diabetic postmenopausal women and their healthy control. SHBG relates inversely to BMI and insulin resistance in diabetic postmenopausal women. It is in consistence with a previous data that low circulating SHBG is associated with abdominal fat^{11,12,13} along with hyperinsulinemia, glucose intolerance with a risk of type 2 diabetes and cardiovascular diseases in postmenopausal women^{14,15,16,17}. Moreover the accumulation of adipose tissue coincide with the onset of menopause may also explain partly the increased risk.¹⁸

In women before or after menopause, androgenic profile shows to be associated with abdominal obesity with the rise in free testosterone level and reduced concentration of circulating SHBG¹⁹.

Moreover it was found that free testosterone is strongly associated with hyperinsulinemia and hyperglycemia in post-menopausal women with metabolic syndrome. In our study we did find higher level of free testosterone in diabetic group of women but it was not strongly significant. Further we did observe a strong negative correlation with SHBG and free testosterone in diabetic women.

In recent years several clinical studies have proved the inhibitory effect of hyperinsulinemia on SHBG production from the liver. SHBG is known as transport protein for sex steroids, its reduced concentration increases the bioavailability of free steroids. Thus free testosterone available in the circulation alters the glucose homeostasis among the diabetic subjects. Thus supporting the androgen function in the metabolism of glucose Numerous studies reported the mechanism by which androgen and insulin resistance may be connected. Abdominal obesity may itself lead to hyperandrogenism by converting adrenal androstenedione to testosterone via 17- β -hydroxysteroid oxidoreductase in abdominal adipose tissue which preferably results in hyperinsulinemia²⁰.

Drastically low SHBG concentration in women was found to be associated with adverse blood lipid profile^{21, 22}. In our study, SHBG was positively correlated with HDL-C. Several previous studies suggest the influence of SHBG on HDL metabolism. This effect possibly

may be due to estradiol – testosterone imbalance or the relationship between hyperinsulinemia and SHBG, where insulin may be the regulatory factor for both SHBG and HDL. Insulin acts as an inhibitory factor for the production of SHBG by human hepatoma cells [HEP G2]²³. Further activity of hepatic lipase synthesized by hepatocyte increases which has a major role in HDL-C metabolism causing the Apo B conversion containing lipo-protein into minor LDL, and thus the depletion of HDL cholesterol levels²⁴.

An increased concentration of dehydroepiandrosterone (DHEA) is observed in diabetic women when compared with control subjects and we did found a strong negative correlation with SHBG among diabetic women. DHEA has been associated with impaired fasting glucose in a crosssectionally studied data²⁵. After menopause adrenal glands constantly produces the precursors steroids like DHEA and androstenedione in a huge amount there by altering the androgen estrogen ratio^{31,32}. This explains that DHEA may be converted to higher concentration of testosterone which again alters the glucose levels in diabetic women.

Estrodiol is considered to be an amplifier of SHBG. Its concentration supresses after menopause. In this study Estrodiol level were positively correlated with SHBG . This relation was in accordance with a previous study which support that Estrodiol is an important determinant of SHBG concentration in blood in post-menopausal women²⁶. In women the relationship between estrogen and insulin resistance is U-shaped where increased and reduced levels are associated with insulin resistance and diabetes.

In conclusion this study indicates that 1) there is a significant difference in the blood concentration of SHBG in diabetic women when compared with healthy control subjects 2) SHBG levels are correlated positively with Estrodiol and negatively with BMI, Insulin resistance, Free testosterone leading to hyperinsulinemia and hyperandrogenecity. Thus understanding the association between SHBG-sex steroids-Diabetes will contribute to know the actual mechanism and thus the prevention of T2DM in postmenopausal women at risk

Acknowledgement: We thank K.S.Hegde Medical Academy for providing research grants for the present study. We would like to thank all the participants for

their support.

Ethical Clearance was taken from Central Ethics of Nitte Deemed to be university

Source of Funding: Nitte Deemed to be University.

Conflict of Interest: Nil

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Effectiveness of Foam Texture Versus Sand Texture on Balance with Diabetic Polyneuropathy Patients: A Comparative Study

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Abstract

Background: Diabetic polyneuropathy (DPN) is a chronic, symmetric, length-dependent sensorimotor polyneuropathy, people with peripheral neuropathy caused by diabetes often experience balance disorder. Foam texture and sand texture improve balance by providing increased stimulation of sensory receptors of the plantar surface of the foot. **Aim:** To find out the effect of foam texture versus sand texture on balance with diabetic polyneuropathy.

Method: a total of 30 subjects age 35 to 70 years (male and female) having diabetic polyneuropathy were included in the study on the basis of selection criteria. Patients have been divided into 2 groups. Group A received balance and conventional exercise on foam texture and group B received balance and conventional exercise on sand texture (30 minutes, 5 times /week, 6 weeks) Outcome measures have been taken on day 1 and after 6 weeks. the data was analyzed using. SPSS 21.

Conclusion: This study concluded that balance exercise on foam texture shows significant improvement in balance in diabetic polyneuropathy patients.

Keywords: Diabetic polyneuropathy, foam texture, sand texture.

Introduction

Diabetic polyneuropathy (DPN) is A chronic, symmetric, length-dependent sensorimotor polyneuropathy and is present in up to 50% of patients with both diabetes type 1 and type 2. ⁷ This pattern of disease onset might suggest that sensory neuronal cell bodies in dorsal root ganglia (DRG) are targeted.² Patients with DPN develop gradual and insidious damage to the distal terminals of sensory neurons first, with symptoms of tingling, pain or loss of sensation in their toes.²

The WHO estimated that 422 million people worldwide were living with diabetes in 2014. The lifetime prevalence of approximately: 50 % ². Patients have lack of accurate proprioceptive information from

the lower extremities in DPN patient has resulted in postural instability during different static and dynamic situations, therefore, they are at A high risk for falling.^{5,6} People with peripheral neuropathy caused by diabetes often experience balance disorder. ⁶

Sensory impairments of the limbs may lead to the balance problem.⁴ due to balance impairment patients have complained of fear of falling.⁶ Foam texture and sand texture significantly improve the postural stability due to providing increased stimulation of sensory receptors of the plantar surface of the foot. ^{1,4} And this textures enhanced somatosensory feedback. ^{1,4}

Method

- **Type of Study:** Comparative Study
- **Time/ Duration of Study:** 6 Months
- **Place of Study:** Various Hospitals in Rajkot
- **Sample Size:** 30

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- **Sampling technique:** Convenient

RK University (ECR/259/Indt/GJ/2016).

Selection Criteria:

Informed in Detail the Whole Procedure of Study to The Patients and Consent Taken prior to the procedure. 30 Subjects Divided into 2 groups. Balance assessed by the time up and go test and modified fall efficacy scale. Group A included 15 participants underwent the balance exercises on foam texture for 20 minutes and conventional exercise for 10 minutes while group B included 15 participants underwent the balance exercises on sand texture 20 minutes and conventional exercise for 10 minutes.

Inclusion Criteria:

- 35 To 70 Year Age, Male and Female Both
- Type1 and 2 Diabetic Mellitus Who Had the Ability to Stand On Both Feet and On One Leg
- Medically Diagnosed with Diabetic Polyneuropathy.

Exclusion Criteria:

- Diabetic Ulcers in Either Foot
- Lack of Blood Sugar Control
- Internal Ear Infections
- Other Nervous System Impairments (Except Neuropathy) Or Other Diseases Affecting Balance,
- Musculoskeletal Problems Such as Vertebral Column and Limb Deformity,
- History of Repeated Ankle Sprains in The Year Before, Severe Pain Influencing Balance
- Lower Limb Fractures

TUG and MFES assessed the first day and after 6 weeks

RESULT:

DATA ANALYSIS:

Descriptive statistics were used to describe sample characteristics. The significant level selected was 0.05.

STATISTICAL ANALYSIS

SPSS version 21 for windows was used for the statistical analysis.

There are two outcome measures.

1. time up and go test paired t-test – intragroup analysis and independent t-test – intergroup analysis
2. modified fall efficacy scale The Wilcoxon Signed Rank Test - Intragroup analysis and Mann-Whitney U Test - Intergroup analysis.

Procedure

The trail was registered in the clinical trial registry (CTRI /2019/09/028007) and ethical clearance was taken from the ethical committee, school of physiotherapy,

TABLE 1: GROUP A (FOAM TEXTURE) INTRA GROUP ANALYSIS

Outcome Measure		Mean	Standard Deviation	Value	P- Value
TUG	PRE	17.801	2.916	T=6.977	0.000
	POST	14.546	2.554		
MFES	PRE	5.466	1.407	Z=-3.439	0.001
	POST	8.066	1.032		

Intragroup analysis of group A in Table 1 suggests that there is a significant difference in both measurement (TUG AND MFES) after 6 weeks of Balance exercises on foam texture.

TABLE 2: GROUP B (SAND TEXTURE) INTRA GROUP ANALYSIS

Outcome Measure		Mean	Standard Deviation	Value	P-Value
TUG	PRE	17.746	2.531	T=10.583	0.000
	POST	15.969	2.503		
MFES	PRE	6.066	1.099	Z=-3.626	0.000
	POST	7.266	1.032		

Intragroup analysis of group B in Table 2 suggests that there is a significant difference in both measurement (TUG and MFES) after 6 weeks of Balance exercises on sand texture.

TABLE 3 INTERGROUP ANALYSIS

Outcome Measure	Mean		Standard Deviation	Value	P Value
	A-POST FOAM	B-POST SAND			
TUG	14.546	15.969	1.806	T=2.715	0.01
MFES	8.066	7.266	1.093	Z=-1.976	0.04

Intergroup analysis is suggesting that group A showed significant improvement than group B. There is a more significant improvement in balance in patients with diabetic polyneuropathy.

Discussion

The purpose of the study was to compare the effectiveness of balance exercise on foam texture Vs balance exercise on sand texture on balance in diabetic polyneuropathy patients. In the study TUG and MFES were taken to analyze the balance and confidence level while performing ADL. The results show improvement in the balance in both groups. but balance exercise on foam texture was more significantly improved Than sand texture. So the null hypothesis is rejected. Balance training is known to be very effective in the rehabilitation of diabetic polyneuropathy when incorporate with sensory input are challenging and progressively induce the patient to use lower limb somatosensory inputs to maintain balance. Both group's post-training showed improvement in balance. Training on the foam texture shows that more displacement in the body center of mass than sand texture. The information got from vestibular,

visual and proprioceptive and mechanoreceptors in the muscles and joints afferents processed by the central nervous system with motor command^{3,4,6}

The current study showed that there was a significant difference between group scores of TUG and MFES. Sensory input integration is very important for maintaining equilibrium during walking and found improves postural adjustment mechanism, which directly influences on balance. And there was an improvement in independence in mobility, and fairly good static balance and low risk of fall. Foam texture is effective on balance and this article support it:

Akkradate Siriphorn reported that balance training performed on a foam texture significantly improved postural stability in Healthy Young Adults. **Hatton** al suggested that Standing on textured surfaces to develop the therapeutic benefits of textured surfaces as an intervention to improve the balance in healthy older

adults. **Anna Lucy** Concluded that The effect of textured surfaces had a significant influence on postural stability and lower limb muscle activity. **Hj Shin** reported that Therapeutic Effects on sea sand effectively improved balance and decrease pain and fatigue. **Marialuisa Gandolfi** reported for the first time that exercise performed in different sensory contexts may significantly improve dynamic balance in multiple sclerosis patients. The mechanism behind the effectiveness of foam texture balance exercise is proprioceptive information from the lower extremities in DPN patients has resulted in postural instability during different static and dynamic situations. Foam texture improves balance by providing increased stimulation of sensory receptors of the plantar surface of the foot when the loss of balance was imminent and it enhanced somatosensory feedback. And it became challenging than sand texture. A limitation of the study that the Patients were not fitting properly in inclusion-exclusion criteria. Due to the lengthy procedure of the rehabilitation process, Patients were not following the six-week protocol continuously. To make sure that patients performing the exercise properly Supervision needed to be done while treating patients.

Conclusion

Balance exercise on foam texture and sand texture shows significant improvement on balance in diabetic polyneuropathy patient but there is a more significant improvement in foam texture so this study concluded that foam texture effective than sand texture on balance in diabetic polyneuropathy patients.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Ethical clearance has been taken.

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Knowledge, Compliance and Determinants of Use of Standard Precautions for Infection Control among Health Care Workers – A Teaching Hospital Based Study

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Abstract

Introduction: Standard Precautions, which are easily implementable and universally acceptable interventions, can help reduce the transmission of infections in the health care setting. However, knowledge and compliance with regard to Standard Precautions remains unsatisfactory.

Materials and Method: This cross sectional study was conducted on 200 health care workers (HCWs) at ESIC Medical College & Hospital, Faridabad. A self-administered structured questionnaire with specific subsections to assess knowledge, attitude and practice of Standard Precautions was used for data collection. Regression analysis was used to analyze the relation between knowledge, attitude and compliance. Chi Square test was used to determine relation between various determinants and the knowledge and practice of Standard Precautions.

Results: Mean knowledge, attitude and compliance scores among HCWs were 11.47 ± 4.16 , 7.09 ± 1.46 and 10.72 ± 2.57 respectively. A moderately positive correlation was observed between knowledge and attitude scores ($r=0.421$, $p<0.001$). Mean knowledge scores were higher for females, higher professional posts, those with previous Hepatitis B immunization and those with history of recent occupational exposure. Compliance scores were higher for females, for those with more professional post and in those with history of recent needle stick injury. A significantly greater number of females ($p=0.02$), trained HCWs ($p=0.003$), doctors & nurses ($p=0.003$), Hepatitis B immunised personnel ($p=0.003$) and those with history of recent occupational exposure ($p<0.001$) within the past 1 year had satisfactory knowledge scores. Similarly, significantly more number of female HCWs ($p=0.004$), nurses ($p=0.001$), experienced HCWs ($p=0.01$), and those with history of recent needle prick injury ($p=0.04$) achieved satisfactory compliance scores.

Conclusion: The knowledge and compliance of Standard Precautions is generally poor. Pre- induction and periodic in- house training in Standard Precautions should be mandatory for all health care workers along with compulsory Hepatitis B immunization to reduce the risk of occupational exposure in the health care setting.

Key Words: *Standard Precautions, Infection Control, Health Care Workers*

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Introduction

Standard Precautions are a set of easily implementable infection prevention interventions based on the principle that all blood and body fluids are potential sources of infection regardless of diagnosis, presumed infectious

status or health care setting.¹ These broadly include hand hygiene, use of personal protective equipment, safe handling of sharps and provision of a protective environment.² The prevalence of health care associated infections is 7.6% in the developed and 10.1% in the developing world.³ 40% of Hepatitis B and C infections and 2.5% of all HIV infections in health care workers (HCWs) are occupationally acquired. 90% of these occur in developing countries.⁴ The reasons for low adherence to Standard Precautions include limited knowledge, lack of appropriate facilities and staffing, non-availability of funds and high patient load. Awareness and compliance were significantly associated with training in Standard Precautions.⁵ Reasons for poor adherence to Standard Precautions include work stress, time constraint, lack of supply of personal protective equipment, lack of display of guidelines and emergency situations.⁶ Assessment of the prevailing knowledge, notions and practice of Standard Precautions is thus mandatory to identify knowledge deficits and plan effective interventions specifically tailored to local needs for effective infection control.

Objectives

1. To assess the knowledge, attitude and compliance of Standard Precautions among HCWs
2. To identify determinants of knowledge and practice of Standard Precautions in HCWs

Methodology

Study setting and participants

A cross sectional study was conducted in August 2018 on HCWs working at ESIC Medical College, Faridabad to assess the knowledge, attitude and practices and identify determinants which influence the knowledge of and compliance to infection control. A sample size of 197 was calculated with 95% confidence interval and 5% margin of error. This was rounded up to 200 HCWs. Ethical approval was taken from the Institutional Ethics Committee. Participants were selected by simple random sampling from an institutional list of health care workers. All doctors, nursing staff, laboratory/OT technicians and nursing orderlies/porters and house-keeping staff employed full-time in the hospital were eligible to participate in the study. Those who refused to participate were excluded.

Study Tool

Data was collected through a self-administered questionnaire based on CDC¹, NHS⁷ and WHO⁸ guidelines for Standard Precautions. The structured questionnaire comprised of 4 main sections- one each on demographic data, knowledge, attitude and compliance related questions. The questionnaire was tested for content validity by experts in Standard Precautions and for internal consistency (Cronbach's alpha = 0.72). After informed consent, the questionnaire was administered to participants. For those with language-related difficulties, translation was provided. The demographic details in Part I included data on age, gender, professional post held, marital status, prior training in Standard Precautions, total job experience, history of immunisation against Hepatitis B and needle prick injury. In Part II, 10 multiple choice questions tested knowledge of Standard Precautions. One point was awarded to each correct answer. No points were awarded for incorrect answers. In order to reduce guessing and chance selection of an option, questions were designed so that a question could have multiple correct answers. The knowledge score ranged from 0-20. Part III comprised of 10 questions that tested attitude towards Standard Precautions use. A correct response was given 1 point and an incorrect response was given no points. Attitude score ranged from 0 to 10. Part IV comprised of 15 multiple choice questions testing compliance to Standard Precautions. Correct response was awarded one point and no points were given for incorrect response. Score ranged from 0 to 15.

Statistical Analysis

For any HCW, knowledge, attitude or compliance score of $\geq 70\%$ was considered satisfactory and $< 70\%$ was considered unsatisfactory. Data was checked for completeness and consistency and was statistically analysed using SPSS 17.0 software. Frequencies and percentages of demographic variables, and average scores with Standard Deviation (SD) for knowledge, attitude and compliance of Standard Precautions were obtained. The knowledge, attitude and compliance among HCWs was evaluated vis-a-vis demographic variables, h/o training in Standard Precautions, immunization and h/o needle prick injury. Chi Square test was used to measure association between the categorical variables and $p \leq$

0.05 was considered significant. Regression analysis was used to investigate the association between knowledge, attitude and practice of Standard Precautions.

Results

The baseline characteristics of the study population are detailed in Table 1. Only 68.5 % had received complete Hepatitis B immunization. Of these, 33 (52.4%) HCWs were occupationally exposed in the past 1 year. Only 56.5 % of the HCWs had received prior training in Standard Precautions. Amongst the exposed, majority (56.3%) were untrained in Standard Precautions ($p=0.001$).

Only 28%, 36% and 54.5 % of the HCWs attained satisfactory knowledge, attitude and compliance scores respectively. (Figure 1)

The mean knowledge, attitude and compliance scores among HCWs were 11.47 ± 4.16 , 7.09 ± 1.46 and 10.72 ± 2.57 respectively. A significant moderate positive correlation was observed between mean knowledge and attitude scores ($r=0.421$, $p<0.001$).

Females had significantly higher mean knowledge scores ($p=0.01$). Mean knowledge scores were also significantly higher ($p=0.006$) for higher professional posts held. Also, mean knowledge scores were significantly higher in HCWs who had received prior Hepatitis B immunization ($p=0.024$). Similarly, scores were significantly higher in those with occupational exposure in the preceding year ($p=0.003$). No significant difference in scores was seen with respect to age, marital status, years of experience and prior training in use of Standard Precautions.

Mean compliance scores were significantly higher for females ($p=0.001$). They also increased significantly with higher professional post ($p<0.001$). Mean scores were higher in those who received a needle prick in the preceding year. ($p=0.003$)

Mean attitude scores were significantly higher for older ($p<0.001$) and married HCWs ($p=0.012$). Mean attitude score was also better in those who had received prior training in use of Standard Precautions ($p=0.001$) and in those who had sustained needle prick/ sharps injury in the previous 1 year ($p=0.004$).

Further, after grouping HCWs as per satisfactory and unsatisfactory knowledge, attitude and compliance scores, determinants of good performance under each of these categories were then analysed.

A significantly greater number of female HCWs ($p=0.02$), trained HCWs ($p=0.003$), doctors & nurses ($p=0.003$), Hepatitis B immunised personnel ($p=0.003$) and those with history of recent occupational exposure ($p<0.001$) within the past 1 year had satisfactory knowledge scores. (Figure 2) Similarly, significantly more number of female HCWs ($p=0.004$), nurses ($p=0.001$), experienced HCWs ($p=0.01$), and those with history of recent needle prick injury ($p=0.04$) achieved satisfactory compliance scores. (Figure 3)

Table 2 demonstrates data regarding compliance to certain key components of Standard Precautions in our subjects and compares it with data from other authors.^{6,9,10,11,12}

Table 1. Baseline characteristics of study population

	No of HCWs (N=200)	Percentage
Age distribution		
< 30 years	122	61.0
31-40 years	55	27.5
41-50 years	18	9.0
50-60 Ears	2	1.0
>60 years	3	1.5

Cont... Table 1. Baseline characteristics of study population

Sex		
Male	90	45.0
Female	110	55.0
Marital status		
Married	122	61.0
Unmarried	78	39.0
Professional Post held		
Doctor	110	55.0
Nursing staff	39	19.5
Lab technicians	23	11.5
Nursing orderlies	14	7.0
Housekeeping staff	14	7.0
Years of Experience		
<1 year	32	16.0
1-5 years	102	51.0
6-10 years	32	16.0
>10 years	34	17.0
Whether received training in Standard Precautions		
Yes	113	56.5
No	87	43.5
Received Hepatitis B immunization		
Yes	137	68.5
No	63	31.5
Overall Significant Occupational Exposure within last 1 year		
Yes	87	43.6
No	113	56.5
Needle Prick/Sharps Injury within last 1 year		
Yes	65	32.5
No	135	67.5

Table 2. Comparison of the Practice of Standard Precautions by HCWs in various studies

	Chaudhari et al6	Fayaz et al9	Kotwal et al10	Ogoina et al11	Paul et al12	Present study
Glove use when exposed to body fluids/blood/products	24%	92.6%	85%	96.5%	87%	94%
Hand hygiene	79.6%	83.0%	52%	95.8%	79%	91%
Use facemask to prevent splash	35.2%	87.7%	54%	-	74%	72%
Do not recap needle after use	18.2%	42.2%	60%	47.7%	53%	39%
Practice proper waste sharp disposal	61.2%	90.3%	89%	-	-	48.4%

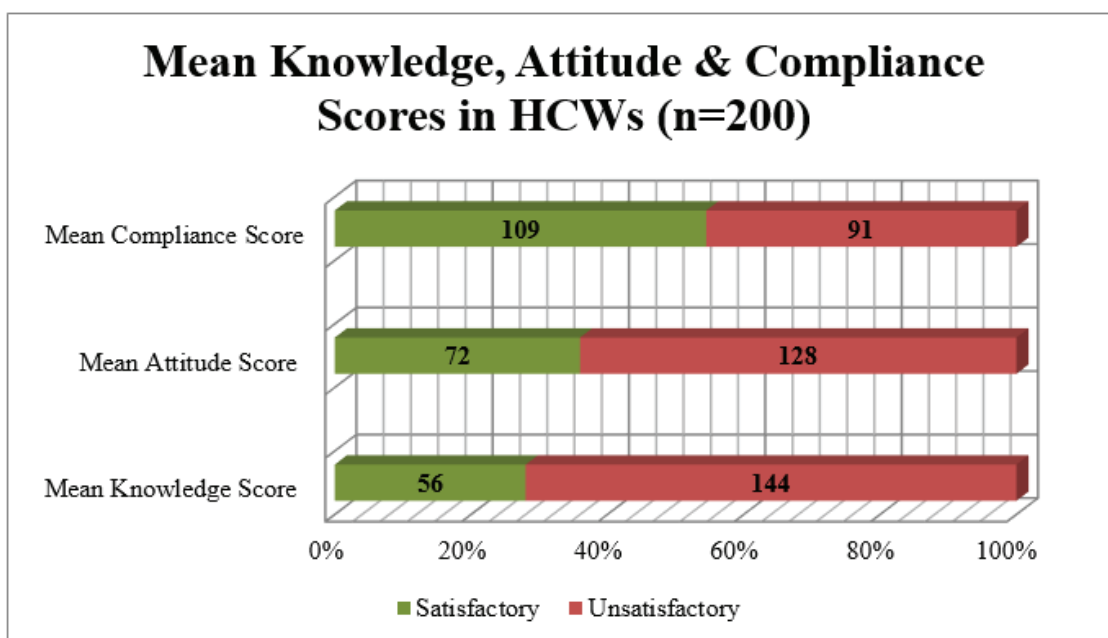


Figure 1. Distribution of HCWs vis-à-vis Satisfactory and Unsatisfactory Scores

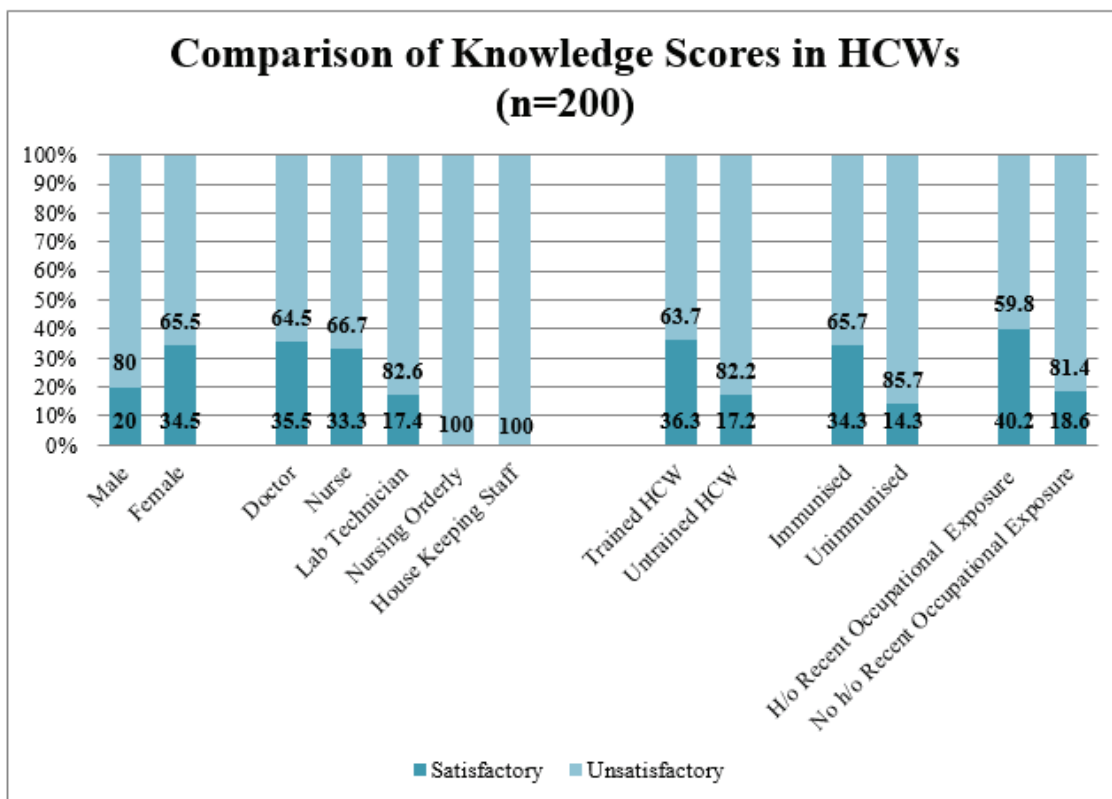


Figure 2. Determinants of “Satisfactory” Knowledge of Standard Precautions amongst HCWs

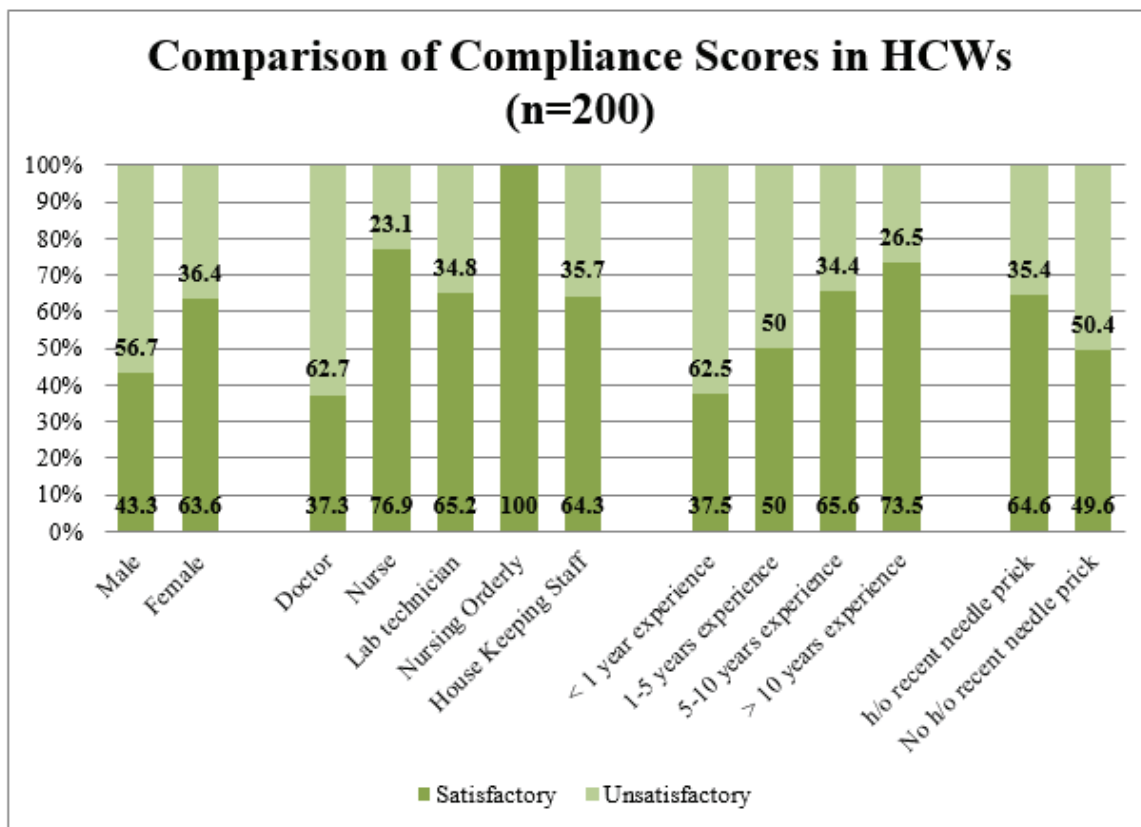


Figure 3. Determinants of “Satisfactory” Compliance to Standard Precautions amongst HCWs

Discussion

Mean per cent knowledge, attitude and compliance scores (in per cent) were 57.3%, 70.9%, 71.46%. Knowledge of Standard Precautions in HCWs was found to be very unsatisfactory. Attitude and compliance scores were satisfactory. The discrepancy in knowledge and practice, and the observed upward trend in scores from knowledge to attitude to compliance could be result with a social desirability bias amongst the participants. The actual compliance is likely to be lower amongst HCWs. A similar discrepancy in mean knowledge and practice scores is detailed in another study.⁵ In a study conducted on Iranian subjects, the mean knowledge, attitude and practice scores were 83.5%, 72.4% and 73.4% respectively. Only 45% HCWs were found to possess 'Good' knowledge. Despite a high mean compliance score in HCWs, only 45.5% were able to attain a compliance score of >70%.¹³

A moderately positive correlation was observed between knowledge and attitude scores but not among other parameters. Mean knowledge scores were higher for females, higher professional posts, those with previous Hepatitis B immunization and those with history of recent occupational exposure. Compliance scores were higher for female HCWs, for those with higher professional posts and those with history of recent needle prick injury. In the previously quoted Iranian study, knowledge scores were higher in married HCWs (40.28 v/s 36.17, $p=0.01$). Practice scores were similarly higher in married HCWs (35.15 v/s 32.00, $p=0.002$) and in trained professionals (35.45 v/s 31.81, $p=0.01$).¹³ Other researchers have noted that the odds of having adequate knowledge of as well as compliance to Standard Precautions were significantly greater in older HCWs, in those with more years of service and higher professional post held. Also, increasing age and history of Hepatitis B immunization improved odds of good knowledge but did not significantly affect compliance.⁹

We observed that use of gloves, hand hygiene and personal protective equipment has achieved acceptable, but not ideal levels. With respect to sharp handling and disposal, we lag behind other comparable studies.^{6,9,10,11,12} (Table 3)

Amongst our subjects, 32.5 % reported a needle stick/sharps injury in the preceding year. This is lower

than studies in other teaching hospitals where incidence ranges from 47%- 53%.^{5,14,15,16}

68.5% of HCWs were immunized against Hepatitis B. Of the 63 non immunized individuals, 42.7% had sustained a needle prick injury in the past 1 year alone. This suggests that there is a need to specifically target younger HCWs, newer recruits and those at lower professional rungs by quality induction and periodic in- house training and orientation of HCWs. Similarly, Hepatitis B immunization could be made mandatory before induction to duty and active 'mop-up' immunization drives could target non immune in- house candidates.

It was noted that training in Standard Precautions had significantly improved attitude towards use of Standard Precautions. However, there was no appreciable difference in knowledge or compliance amongst trained and untrained HCWs which indicates a need for improvement in the quality and content of training.

We encountered a participation bias and over representation of doctors in the sample due to reluctance in other HCWs to participate. Also, the observed disproportion between knowledge and compliance scores (social desirability bias) could be avoided by introducing an OSCE or clinical observation component in future studies.

Conclusion

The knowledge and compliance of Standard Precautions is generally poor amongst a majority of health care workers. The factors responsible for poor knowledge and compliance include male sex, younger age, less years of service, lower professional post and lack of prior training of Standard Precautions. There is a moderate correlation between knowledge of Standard Precautions and attitude towards compliance. It is concluded that pre- induction and periodic in- house training in Standard Precautions should be mandatory for all health care workers along with compulsory Hepatitis B immunization to reduce the risk of occupational exposure in the health care setting.

Conflicts of Interest: Nil

Sources of Funding: Self

Ethical Clearance: Taken from Institutional Ethical Committee

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Parental Awareness of Musculoskeletal Health Consequences Due to Overweight Bag in Primary School Students

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Abstract

Background: Musculoskeletal discomfort is high in school going children in Kolhapur. The primary trigger for the discomfort is heavy school bags as identified through previous studies. Despite the Government of Maharashtra's resolution to limit the school bag weight, a significant load reduction is lacking. Here we assessed the awareness and corrective measures regarding the weight of the school bag in parents and school authorities in primary school children.

Materials and Methods: In this Cross sectional, prospective study, five schools, namely—A, B, C, D, E were selected based on feasibility. Two hundred and one consenting parents of students belonging to class 1 (6-7 year) from each school filled out a pre-tested questionnaire to assess their awareness. Statistical analysis of the response was calculated through chi-square test ($P < 0.05$).

Results: Predominant weight carried by school children exceeded 10% of their body weight (mean total weight: 3.891 ± 1.96 kg; gross weight: 3.014 ± 1.63 kg; $n=154$). Prevalence of musculoskeletal discomfort was 52.7%. Style of carrying the school bag significantly influenced development of discomfort ($P=0.002$). School authorities ($n=5$) and parents were aware of the Government resolution ($n=183$). But parents neither considered the weight of the bag at the time of purchase ($n=148$) nor helped their children pack their school bags ($n=137$).

Conclusion: While there is increased awareness in parents and school authorities, there is lack of action. Corrective measures in terms of behavioural attitudes in parents and school authorities is necessary to bring about the expected changes.

Keywords: Musculoskeletal discomfort, school backpacks, parental awareness, load carriage

Introduction

A popular topic of health concern in school going children is growing musculoskeletal discomfort and a high prevalence in Kolhapur has been previously observed in primary and middle school children. ⁽¹⁾ The

predominant cause for discomfort is heavy school bags. ⁽²⁻¹⁰⁾ On an average, school children carry heavy loads for a period of 12 years and prolonged stress on the vulnerable spine is a predisposing factor for adolescent spinal discomfort. ⁽⁹⁾

In order to alleviate the carry load, Government of Maharashtra recommends safe load limit for the school students as less than 10% of their body weight. ⁽¹¹⁾ Despite extensive studies regarding the detrimental effects of excessive schoolbag weight carriage ^(4,12,13) and Government resolutions to tackle the same there persists a lack of awareness and implementation at the grass-root level which is the primary contributor for the high prevalence of musculoskeletal health problems. ⁽¹⁴⁾

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Hence, the aim of the study was to assess the levels of parental awareness on musculoskeletal discomfort in their children and over-all involvement in the choice and weight of school bag in primary school children of age 6-7. To the best of our knowledge, this is the first report of parental awareness of musculoskeletal discomfort in the age group of 6-7 years.

Materials and Methods

All procedures were followed in accordance and on receiving approval from the Institutional ethical committee and with Helsinki Declaration of 1975, as revised in 2000. Data collection commenced after receiving approval and consent from the respective school authorities and parents. Consent forms were sent with the students. Of the 234 consent forms distributed, 201 were returned.

The cross-sectional study was conducted in 5 schools (A, B, C, D, E) in the city of Kolhapur in August 2015 based on feasibility. The study sample size was extracted from the previous study and was limited to only students in the first grade. Time for data collection spanned over a period of one week and the questionnaires were distributed to the students with an instruction to have it filled by their parents. Post submission of the filled questionnaire and the consent forms, a surprise visit was made to the respective schools. Bags were weighed using a standard weighing scale and recorded as Gross weight and Total weight.¹

All first graders who were day scholars, between the age of 6-7 and whose parents had given consent were included in the study. Children who complained of orthopaedic problems, or having ankle deformities, or leg length discrepancy or wheelchair bound were excluded from the study. The primary tools for assessment were a weighing scale ($\pm 100\text{g}$) for objective testing and pre-tested questionnaire.

The preliminary questionnaire was validated through a pilot study involving 20 primary school students belonging to class 1.⁽¹⁾ Contents of the questionnaire was broadly divided into 2 parts: general information of the students and Body Discomfort chart (BDC) to record the site of discomfort. Given the difference in the medium of teaching, the original English questionnaire was translated to Marathi. Time taken to fill up the

questionnaire was less than 10 minutes.

Data collected were entered in MS Excel and categorical variables were represented as percentage and frequency. Proportion difference between the variables were compared through Chi-square test ($P < 0.05$).

Results

High parent participation at 85.9% was noted as assessed by the return of the filled-out questionnaires. The gender distribution among the school children is presented in Table 1. The mean weight of the students was 18.41 ± 3.87 kg. Average height of the children was 111.70 ± 7.81 cm. None of the students were consuming any growth supplements. The mean weight and gross weight the school bags were noted as 3.891 ± 1.96 kg and 3.014 ± 1.63 kg, respectively. Predominantly, weight of the school bag was greater than 10% of body weight in all schools ($n=154$) except for school D, wherein it was comparable. Prevalence of musculoskeletal health problems, as assessed through BDS, in students of school A, B, C, D and E was 77.1%, 87.1%, 45.8%, 0% and 64.1 %, respectively. Prevalence of musculoskeletal health problems was 52.7% ($n=106$); neck and shoulder region pain or discomfort were the most common.

Style of carrying the school bag had a significant association with the development of musculoskeletal discomfort ($P=0.002$). Children who carried their school bags on one shoulder and low slung were more prone to experiencing musculoskeletal discomfort than the those who carried their bags high slung and, on both shoulders (Table 2).

Mode of travel had a significant association with discomfort. It was observed that unit increase in the gross school bag weight doubled the likelihood of experiencing discomfort (OR 2.268, $P=0.000$). Students who walked to school ($n=23$) were 5 times more likely to experience discomfort than the ones who travelled by car ($n=7$), rickshaw ($n=140$) and bus ($n=13$) (OR 5.545, $P < 0.046$).

Awareness of Government of Maharashtra resolution of school bag weight load

All the schools included in the study were aware of the Government of Maharashtra resolution to alleviate

musculoskeletal health problems in school students. Most of the schools (n=3), reviewed the timetables to mitigate musculoskeletal discomfort in students. Surprisingly, majority of the schools (n=4) did not educate the students on weight and size of the bag. However, to mitigate the school bag load, school C provided lunch and water, and School D provided locker facilities for students. All school authorities reviewed their timetables and promoted daily physical activities in students (Table 3).

Most parents were aware of the GoM resolution of school bag weight (n=183). Of this, only 53 parents took into consideration the self weight of the school bag at the

time of purchase. Majority of the parents did not consider the bag weight (n=148). This significantly contributed to musculoskeletal discomfort ($P < 0.05$). Interestingly, when parents bought a school bag considering the child's choice and weight (n=104), musculoskeletal discomfort was significantly reduced ($P = 6.08e^{-12}$). At the same time, there was a significant association between parents who helped their child pack the bags and musculoskeletal discomfort ($P = 2.2e^{-16}$). These children (n=64) did not complain of musculoskeletal discomfort. It is of great interest that most parents confirmed that their child was experiencing musculoskeletal discomfort (n=99) (Table 4) but did not consider that helping their child pack the school bag.

School		A	B	C	D	E	Total	
Number of students	Female (F)	17	12	9	21	25	84	
	Male (M)	18	19	15	26	39	117	
	Total (T)	35	31	24	47	64	201	
Schoolbag weight carried	≤ 10%	0	0	23	24	0	47	
	>10%	35	31	1	23	64	154	
Musculo-skeletal discomfort	Present	F	14	10	5	0	17	46
		M	13	17	6	0	24	60
		T	27	27	11	0	41	106
	Absent	F	3	2	4	21	8	38
		M	5	2	9	26	15	57
		T	8	4	13	47	23	95

Table 2: Effect of style of carrying school bag and musculoskeletal discomfort

School bag style	Discomfort		Total	P value
	Present	Absent		
One strap	1	0	1	
Two straps	105	95	200	0.0002*
Way of carrying school bag				
Single shoulder	8	7	15	
Both shoulders	98	88	186	0.000*
Style of carrying school bag				
High slung	10	9	19	
Low slung	96	39	135	0.0000*
Normal recommended way		47	47	

*P significant at < 0.05

Table 3: Awareness score of schools

School	A	B	C	D	E
Nature of school	Private	Private	Government	Private	Private
Medium of education	English	English	Marathi	Marathi	English
Curriculum	CBSE	SSC	SSC	SSC	CBSE
Aware of the musculoskeletal health problems in school students.	Yes	Yes	Yes	Yes	Yes
Aware of the Government resolution regarding recommended schoolbag weight limit.	Yes	Yes	Yes	Yes	Yes
Review of timetable of the school in the view of tackling the musculoskeletal health problems in children.	Yes	No	Yes	Yes	No
Is the weight and size taken into account in addition to their educational value for teaching and learning?	No	No	No	Yes	No
Are students encouraged to do regular exercise/sport activity in school?	Yes, but not regularly.	Yes, but not regularly.	Yes, but not regularly.	Yes, but not regularly.	Yes, but not regularly.
Locker facility in school	No	No	No	Yes	No
Any other preventive measure adapted.	None	None	Water and lunch provided to the students.	Worksheets for homework.	No

Table 4: Parent awareness of government resolution, school bag weight and child's musculoskeletal pain

	Total	Discomfort		P value
		Present	Absent	
Parent's awareness about the government resolution in school students				
Aware	183	91	92	0.006*
Not aware	18	15	3	
Parent's take self weight of the school bag into consideration while buying it				
Yes	15	6	7	0.000*
No	148	100	48	
Parent's take self weight of the school bag into consideration while buying it				
Yes	64	0	64	0.000*
No	137	106	31	
Parents aware of their child's musculoskeletal pain				
Yes	99	99	0	0.000*
No	102	7	95	

Discussion

Parent's awareness plays a critical role in avoiding musculoskeletal discomfort in children. Majority of the parents were unaware of the contents of the school bag and such studies have been focused on older children and not on children in the age group of 6-7 years.⁽¹⁵⁾ The gap in understanding on the load carried by younger children between the age of 6-7 y and parental awareness is explained here. Despite high parental awareness on load restriction, the average weight carried exceeded 10% of the total body weight. This implies that apart from awareness, parental involvement is crucial: there is a significant impact on load carriage only when parents participate in packing the bag. Even when parents were aware of the child's discomfort, measures to alleviate the same were not evident. Therefore, parental involvement should not be a one-time event during choosing a bag but, a daily routine where they assist their child pack his/her bag. This could significantly alleviate musculoskeletal discomfort in young children.

Highest and average weight carried by students of age 8-13 years is reported to 7kg and 5kg, respectively.⁽¹⁶⁻¹⁸⁾ Although weight carried was varied, the biomechanical impact of the load was significant in all studies.⁽¹³⁾ This implies that carrying a load over 10% of body weight is the primary trigger for musculoskeletal discomfort despite the weight variation.

Manner of carrying the backpack was identified as an important gap in the previous studies (meta analysis). The significant difference observed here between the styles, reflects the importance of right carriage and is influenced by the duration of load carriage. Style of carrying a school bag influences gait kinetics and double strap backpacks improved gait parameters.⁽¹⁹⁾ Heavy backpacks is identified as a significant cause of injuries and the innocuous initial signs are observed as pressure marks (swelling and redness) over the shoulder and neck region where the straps rest. Neck pain or stiffness and upper back pain are common complaints during the academic year and absent during summer holidays.⁽¹⁶⁾ This is linked to carrying heavy school bags and could progress to muscle fatigue.⁽²⁰⁾ On an average, previous studies have concluded that students carry an average of 15% of their body weight.⁽¹⁴⁾ High prevalence of musculoskeletal discomfort in the schools studied is

alarming and requires immediate attention.

Despite the GoM initiative to reduce backpack weight of school going children, there is lack of implementation of the same as evident from measures taken by 2 schools. Surprisingly, children attending government and Marathi medium schools were carrying a lighter load than those attending private schools as compared to CBSE schools which demand heavy textbooks and notebooks as per the curriculum.¹

While carrying school bags is indispensable, active involvement from the parents and school authorities is the key to alleviate the growing problem of musculoskeletal disorders in the young. In conclusion, although, school authorities and parents were aware of musculoskeletal health problems in primary school students, preventive measures were not enforced entirely. Awareness did not reflect as action, therefore behaviour changes in both parents and teachers is necessary.

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Retention of Various Pit and Fissure Sealants in Deciduous Teeth. A Systematic Review

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Abstract

Background: Dental caries is one of the most prevailing oral health diseases in children. Most of these dental caries occur in the deep pits and fissures. Pit and fissure sealants have been traditionally used for preventing dental caries. These are the materials which fill the fissures and making it self-cleansable.

Objectives: To assess the retention rate of various pit and fissure sealants used in deciduous teeth

Intervention: Pit and fissure sealants

Results: A preliminary search yielded a total of 153 studies through Google scholar and search strategy used in PubMed. 7 articles giving 11 estimates were included for qualitative synthesis. All materials were light cured. Retention rate of fluoride releasing sealants and ACP sealants were superior to other sealants.

Conclusion: Pit and fissure sealants have a good retention in primary dentition. Sealants are very well accepted and prove to be effective in preventing occlusal caries found in the large number amongst children. Use of sealants in primary dentition will surely prevent the damage to erupting permanent dentition due to developing caries in the former.

Keywords: Pit and fissure sealants, deciduous teeth, retention rate, fluoride releasing pit and fissure sealants

Introduction

Inspite of being a preventable disease and advancement in the caries detection systems, dental caries still continue to be a common childhood disease. The prevalence of ECC differs according to the group, and a prevalence of up to 85% has been reported for disadvantaged groups.¹ Even though it is largely a preventable condition, ECC remains one of the most common childhood diseases.

Pits and fissures are progressively susceptible to dental caries on the grounds that the life systems

favours plaque accumulation; these zones are regularly inaccessible and close for any oral cleanliness measures to be successful. By filling such anomalies with flowable therapeutic material (pit and fissure sealants) the tooth turns out to be less morphologically susceptible.² This is particularly suggested in younger patients with erupting teeth.

Sealants structure mechanical boundaries that seclude the pits, furrows, and deformities in the gnawing (occlusal) surfaces of the teeth from the dental plaque and dietary constituents. They additionally can also fill irregularities developed in smooth surfaces. Though application of pit and fissure sealants require skilled personnel, patient tolerance and is a technique sensitive procedure compared to that of topical fluorides but the potential benefits outweigh the difficulties encountered. The success of pit & fissure sealants, one of the most important tools in preventive dentistry, is directly

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associated with the material's ability to remain on the tooth surface⁴⁻⁷. Many systematic reviews have been conducted on the effectiveness of pits and fissures on permanent dentition but no pooled evidence of its effectiveness in terms of retention was found regarding primary dentition. Thus this systematic review was initiated with an aim to assess the effectiveness of pit and fissure sealants with respect to retention rate in primary dentition in children.

Materials and Method

Eligibility Criteria

Inclusion and exclusion criteria were fixed and the studies were screened based on the criteria mentioned below:-

Inclusion criteria:

1. Studies done to assess the retention of various pit and fissure sealants in primary dentition.
2. Study designs like randomized controlled trials, clinical trial, prospective clinical studies, and comparative studies done with pit and fissure intervention in one of the group.
3. Studies in English or studies in other languages where translation to English is possible
4. Studies published from the year 1st January 2001 to 31st November 2019.

Exclusion criteria:

1. Studies excluded were reviews, case reports, case series, conference proceedings.
2. Letters to editor, short communications, pre-

clinical and in- vitro studies were also excluded.

PIO from can be referred as:-

1. **Patient Population:** Children with primary dentition
2. **Intervention:** pit and fissure sealants
3. **Outcome:** retention (total loss, partial loss, no loss)

Information Sources

A search strategy was developed using keywords related to pit and fissure sealants in primary dentition. Data was searched through the database, PubMed and Google scholar from 1st January 2001 till 31st November 2019. Cross references were checked for relevant articles, grey literature was also searched on various pit and fissures retention data when applied on deciduous teeth. Hand searching of articles was done when the full texts.

Search

The comprehensive data search was performed in PubMed and Google scholar. While carrying out the search through PubMed the filters were put for the dates of publication as 1st January 2001 till 31st November 2019. The filter on article type was set for comparative study, randomized controlled trial, clinical study, clinical trial, controlled clinical trial and species as humans with best match option for sorting. No language restrictions were put and studies that could no be translated in English were excluded. The keywords for search were decided by reviewing the literature.

The search strategy used in PubMed for searching articles was as follows:

Search strategy

Sr. no.	Search strategy	Articles in hit	Articles selected
1	pit and fissure sealant AND deciduous dentition AND retention	16	11
2	fissure sealants AND primary teeth	20	7
3	dental sealants AND milk teeth	5	1
4	primary teeth AND tooth sealant AND survival	17	5
5	(pit and fissure sealants OR dental sealant OR fissure sealant) AND (deciduous dentition OR primary teeth OR deciduous teeth OR milk teeth) AND (survival OR retention)	48	19
6	glass ionomer sealant AND primary teeth	32	10
7	baby teeth AND tooth sealant AND survival	10	2
8	baby teeth AND tooth sealant AND survival	3	1
9	baby tooth AND pit and fissure sealant AND retention	1	1
10	Others	1	1
	Total	153	58

A total of nine search strategies were formed. Google search was carried out but no search strategy was used for searching articles in Google scholar. Google Scholar yielded only one article which was found to be relevant according to the eligibility criteria.

Results

This systematic review yielded a total of 152 articles through PubMed search strategy and one through Google scholar. After screening 7 articles were selected for analysis. Pit and fissure sealants were intact in all the studies in more than 40% of the treated teeth. The complete retention rate ranged from 43% to the highest of 77%. Partial loss of the sealants was evident in 15.1% to 34.9% of the treated primary teeth while the total loss of sealants was observed in a maximum of 24.4% treated teeth. No complete loss of sealant was found in study conducted by Corona SA et al which used Fluoroshield resin sealant. When it came to assessing the retention there are various standardized criteria present in the literature. Tom and Ryge, color coverage caries sealant evaluation system and ICDAS criteria for retention were used in the include studies. From this systematic review it can be concluded that pit and fissure sealants

are effective in primary teeth and should be considered by the clinician for children with a high caries risk to improve their quality of life.

Discussion

Summary of Evidence

The incidence of caries in the occlusal surfaces of the teeth constitutes more than two-thirds of all caries types.³ Pit & fissure sealant have been used widely for prevention of occlusal caries but there are still no guidelines regarding their use in primary teeth.

Literature reports various studies which have been conducted to assess the retention rate of pit and fissure sealant on permanent dentition. But the retention of sealants in primary dentition still remains a point of debate. This systematic review makes an attempt to report the retention rate of pit and fissure sealant in primary dentition. **Corona SAM et al** conducted a split mouth clinical trial to evaluate the retention rate of a flowable restorative system used as a pit-and-fissure sealant compared with a conventional filled resin sealant Fluoroshield and Flow-It! for a 1-year period. At 6- and 12-month intervals, both materials showed no total loss

for 12 months. Flow-It! Sealants presented a higher retention rate at both 6-month and 1-year evaluations. The authors concluded that the flowable restorative system yielded optimal retention on primary molars. Its retention rate was significantly higher than that of the conventional pit-and-fissure sealant on primary teeth. A retrospective clinical trial conducted by **Ram D et al** to describe the retention rates of a compomer sealant Dyract with non-rinse conditioning placed in three paediatric dentistry practices. 317 sealants were applied in 220 primary molars of 176 children aged 2.5–13 years. Dyract Seal has a lower retention rate than conventional sealants. **Chadwick BL et al** conducted a placebo controlled individual randomised control trial to determine the efficacy of a glass ionomer fissure sealant placed on primary molars in pre-school children at high risk of developing dental caries can decrease the incidence of dental caries. All the children were re-examined once at varying intervals between 12 and 30 months. The overall retention rate in these children for the fissure sealant was 18.7% at a follow-up of 13 months which was quite low. The study concluded that the intervention as used in this population had no effect on caries incidence and it cannot be recommended as a clinical procedure as the retention rate was very low. **Maher MM et al** conducted a randomised split mouth study to assess the retention of pit and fissure sealants in primary teeth after phosphoric acid-etching technique and self adhesive technique. Lower retention rate of 64% and 51% at 12th months versus 82% and 73% at 6 months were found with phosphoric acid etching and self-etch adhesive technique respectively. It was concluded that replacing phosphoric acid-etching with self-etching adhesive Adper Prompt L-Pop does not compromise sealant retention in primary teeth after a 1-year period. **Unal M et al** conducted a split mouth randomised control trial to evaluate the clinical success of three fissure sealants; amorphous calcium phosphate (ACP) containing resin-based sealant Aegis, fluoride-containing resin based sealant Heliobond F, Heliobond Fissure sealants on primary teeth. Follow-up was conducted at 1,3,6,12,18 and 24 after Fissure sealants application. Success rates for retention of sealant material according to 24 months' follow-up were 95.7%, 91.8% and 87.8% for Aegis, Heliobond and Heliobond F respectively. It was concluded that resin based sealants containing ACP or fluoride are more retentive than conventional resin based

sealants. **Honkala S et al** conducted a study to measure the caries preventive effect of sealants applied to occlusal surfaces of primary molars compared to fluoride varnish applications and to assess the retention rate of sealants after 1 year. The follow-up examinations were conducted after 1 year. After 1 year follow up, varnished surfaces were significantly more likely to develop new caries lesions than the sealed ones. 73.0% of the sealants were completely retained and 15.1% partially retained. It was concluded that sealing fissures is better in preventing occlusal caries lesions in primary molars. **Joshi S et al** conducted a split mouth clinical trial to evaluate the clinical performance of high viscosity GIC sealant applied with or without additional light curing in children with early childhood caries. On the basis of the application technique, selected teeth in the study group were further allotted to group A with sealant application with additional light curing and group B with sealant application without additional light curing. It was observed that in Group A that is GIC sealant with additional light curing, the retention rate at 12 months was 44.2% and in Group B that is GIC sealant with no additional light curing it was 43%. It was concluded that retention by high-viscosity GIC sealant applied with or without additional light curing was found to be similar.

Since the review was assessing retention in primary dentition thus the age range in the included articles was from 2.5 years to 13 years. Maximum studies reported had children recruited between the age of 4 to 7 years. The sealant materials used in these studies were all different. Fluorshield resin sealant, Dyract seal light cured self adhesive compomer; glass ionomer sealant, Clinpro light cured sealant and used amorphous calcium phosphate containing resin-based sealant, fluoridated and non-fluoridated sealants. All the sealants used were light cured. All the sealants were placed on either 1st primary molar or 2nd primary molars; maxillary or mandibular. The follow-up period of the studies varied from a minimum of 1 year to a maximum 3 years. Overall follow-up period was short in the included studies. To assess the retention of sealants it is very essential to follow the patients for a long time to have a reliable data for evidence.

Conclusion

Within the limitation of the study it can be concluded

that pit and fissure sealants have a good retention in primary dentition. Sealants are very well accepted and proved materials which prevent the occlusal caries found in the large number amongst children. Thus this can surely be used in primary dentition to prevent caries development in them and also to prevent the damage to erupting permanent dentition due to developing caries in the former. Over all this, it cannot be overlooked that the evidence does not report retention rates from a single retention assessment tool rather there is lack of use of such tools in the literature thus reliability on such evidence should be made with caution.

Ethical Clearance- Taken from ethical committee at D.Y Patil Vidyapeeth

Source of Funding- Self

Conflict of Interest - Nil

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A Cross Sectional Study to Evaluate Tree Plantation and Gardening as an Intergenerational Bonding Activity amongst Geriatric Population

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Abstract

Background: Life expectancy among the elderly has been improving for many decades all over world, the emotional and mental wellbeing of the geriatric people is at stake because of the younger people migrating to the urban areas or even abroad for work, and older people staying alone at their homes.

Few days can be spent by older – younger people together to plant trees. And this intergenerational bonding activity can give a sense of satisfaction and mental wellbeing to the older adults.

Objectives:

1. To find out how older people spend time with younger generations
2. To evaluate if older people are interested in gardening and planting trees as an intergenerational activity.

Methods: We conducted a survey on 120 older people in the community attached to our college, we enquired about the different means by which the older people spend time with the younger generations and if they will be interested in gardening or planting trees together with the younger generations.

Results: There were a total of 120 participants, 60 males and 60 females. Mean age was 68.49 ± 6.83 years. Majority of them interacted with the younger generations daily (55.83%). Chit chatting, managing business and telling stories to children were the common things done together. Majority (70%) felt that they spent enough time with the younger people, while few were not spending time at all with their younger generations (5.83%). 79 participants never planted a single tree (65.83%). 107 participants felt that planting trees is necessary (89.17%) while 104 participants (86.67%) would like to do gardening or planting trees with their younger generations.

Keywords: Intergenerational Activities, Geriatric Mental Health, Tree Plantation

Introduction

Life expectancy among the elderly has been improving for many decades the reason being

advancement of health sector and overall improvement in per capita income of the people all over world,^[1] and there is evidence that the physical health of the elderly has also been improving with these advancement.^[2-4]

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The emotional and mental wellbeing of the geriatric people is at stake because of the increasing urbanization, and younger people migrating to the urban areas or even abroad for work, and older people staying alone at their hometowns.

In the global Sustainable Development Goals [5], goal 13 is Climate Action, “take urgent action to combat climate change and its impacts”. It’s a responsibility which is equally shared by the governments and all the people living on the earth. All the efforts how much ever minimal they may be should be counted as minute steps towards environmental betterment.

Planting and growing trees is one of the major responsibilities we have today on us. [6] All people should come together to help build our green zones inside and nearby cities and villages. Older people have much time left with them, younger people have energy. If all these generations spend some time together, then planting and growing trees can be easily done. People can maintain small gardens at home, every home can have a small nursery of its own where they can grow saplings of the common regional trees, even fruit trees like Mango, Papaya, Custard Apple, Guava. Weekends and few days in the vacations can be spent by older – younger people of the house together to plant these trees near to our houses, residential areas or near to cities. Planting trees have a large potential to conserve energy in urban areas. [7]

When the younger people who live in cities come to visit their parents in the villages, if they spend time together in planting these trees, it will be memories to cherish for both the generations. When the children are away, older parents can remember them while taking care of these trees, when the old people are dead, the children can remember them while eating fruits from these trees. And most importantly every tree that is planted and grown will be a one-step ahead on the path of environmental betterment.

We had conducted this study to see what things older people do with the younger generations and weather they will be interested in planting trees.

Literature Review

AL Park et al [8] studied the impact of intergenerational activities on general wellbeing of older adults. They suggested that geriatric people who are involved in intergenerational activities of any form are healthy both physically and mentally as compared to those people who are left to live alone. They concluded that the geriatric people should be involved in daily

activities in home or in society to improve their overall wellbeing.

CN Reisig et al [9] studied the perception of geriatric people of wellbeing after intergenerational experiences with youth, they also concluded that the intergenerational activities are important for geriatric physical and mental health.

Faer M et al [10] conducted a large project on intergenerational activities between the adolescents, young adults and older adults. They reported that not only the older people but also the adolescents and young adults are benefited from these intergenerational activities and they recommended different social and community activities to be planned and executed on a regular basis. Their project brought together different age-distinct, high risk, ethnically similar populations in an intergenerational, reciprocal support mechanism that addressed those negative factors that affect high-risk behaviour and decisional processes in adolescents and physical and mental functioning in the elderly.

Many authors have raised a concern about the mental and physical wellbeing of geriatric people. [11-13] Some of them suggested the importance of intergenerational activities in improving the overall health of the geriatric people. [14 – 17]

Objectives:

2. To find out how older people spend time with younger generations
3. To evaluate if older people are interested in gardening and planting trees as an intergenerational activity.

Methods

We conducted a survey on 120 in the community attached to our parent medical college, where we enquired about the different means by which the older people spend time with the younger generations and if they will be interested in gardening or planting trees together with the younger generations.

Ethical Clearance for the institutional ethics committee has been taken to carry out this study.

Inclusion Criteria:

1. Old age people of both sexes and age more than 60 years
2. Residents of medical college and hospital area for more than 6 months

Exclusion Criteria:

1. Unmarried people
2. Those who are not willing to participate

Sample Size:

According to a study conducted by **GK Ingle et al** ^[18] the proportion of old age people more than 60 years will be 7.7%,

According to a study conducted by **GK Ingle et al** ^[18] the proportion of old age people more than 60 years will be 7.7%,

So, $p = 7.7\%$

Using formula for sample size (n) calculation,

$$n = \frac{4 \times p \times q}{e^2}$$

Where, $p = 7.7\% = 0.077$

$q = 1 - p = 0.923$

Taking e, absolute error of 5%, $e = 0.05$

$$\text{So, } n = \frac{4 \times 0.077 \times 0.923}{0.05 \times 0.05}$$

$$n = 113.71 \approx 114$$

A minimum of 113 patients will be included in the study, rounding it up to 120 patients.

Sample size = n = 120

Sampling Technique: Convenience Sampling

Statistical methods: A simple questionnaire was prepared and a pilot study was conducted with 20 geriatric participants, the questionnaire along with the results were put forth the institutional research cell to validate the questionnaire. The validated questionnaire in google form format was used to collect the data from the geriatric people in the nearby community. Data was entered in Microsoft excel, qualitative data is shown in numbers and percentages and quantitative data in mean

and SD. Charts and graphs are used to show the results.

Results

There were a total of 120 study participants, 60 males and 60 females. Mean age was 68.49 ± 6.83 years.

Majority of them interacted with the younger generations daily (55.83%) followed by 3 to 4 days a week (30%).

Table 1: Frequency of quality time spent with the younger generations

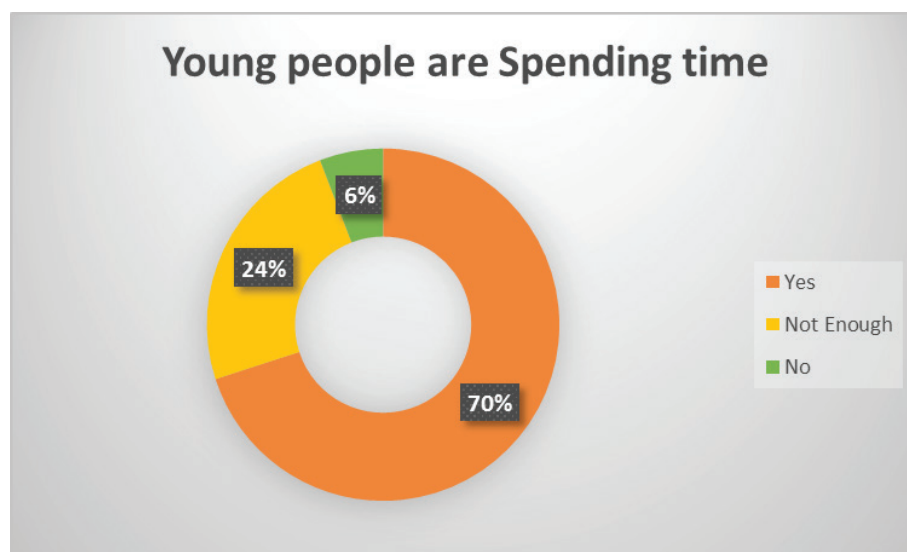
Frequency of quality time spent	Number	%
Daily	67	55.83%
3 to 4 days a week	36	30.00%
1 to 2 days a week	9	7.50%
Once or twice a month or Less	8	6.67%
Total	120	100%

General chit chat (56.67%), managing family business and farms (35%) and telling stories to grandchildren (32.50%), doing Pooja – Bhajans (10%) were the common things done by the participants with their younger generations.

Table 2: Common intergenerational activities done together

Common activities done together	Number	%
General chit chat	68	56.67
Managing family business / Farm	42	35.00
Telling stories to grandchildren	39	32.50
Pooja - Bhajan	12	10.00
Going for a walk	8	6.67
Gardening	4	3.33
Others	9	7.50

Majority (70%) felt that they spent enough time with the younger people, some felt that it was not enough (24.17%) while few were not spending time at all with their younger generations (5.83%).

**Fig 1: Opinion about younger people spending time with older people**

64 participants didn't have their own garden (53.33%), 79 participants never planted a single tree (65.83%). 107 participants felt that planting trees is necessary (89.17%)

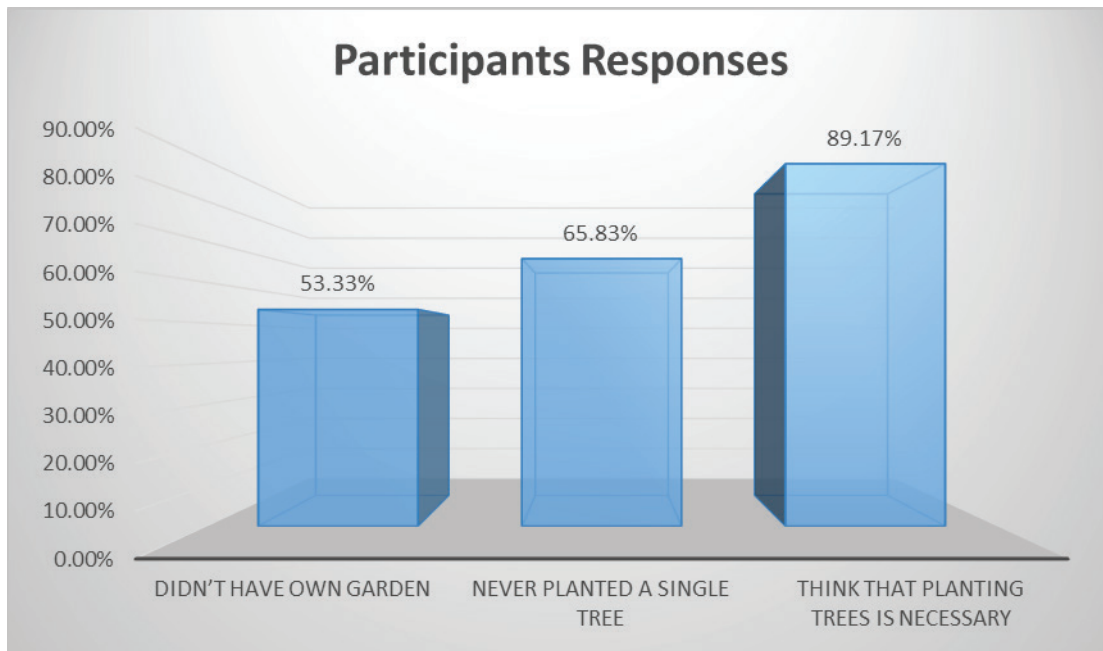


Fig 2: Participants response regarding gardening & tree plantation

104 participants (86.67%) would like to do gardening or planting trees with their younger generations, 9 responded that they might do it (7.50%) while rest 7 showed no any interest (5.83%) in doing gardening or planting trees as an intergenerational activity. Upon one month follow up, we found that 16 families (13.33%) actually did the activity.

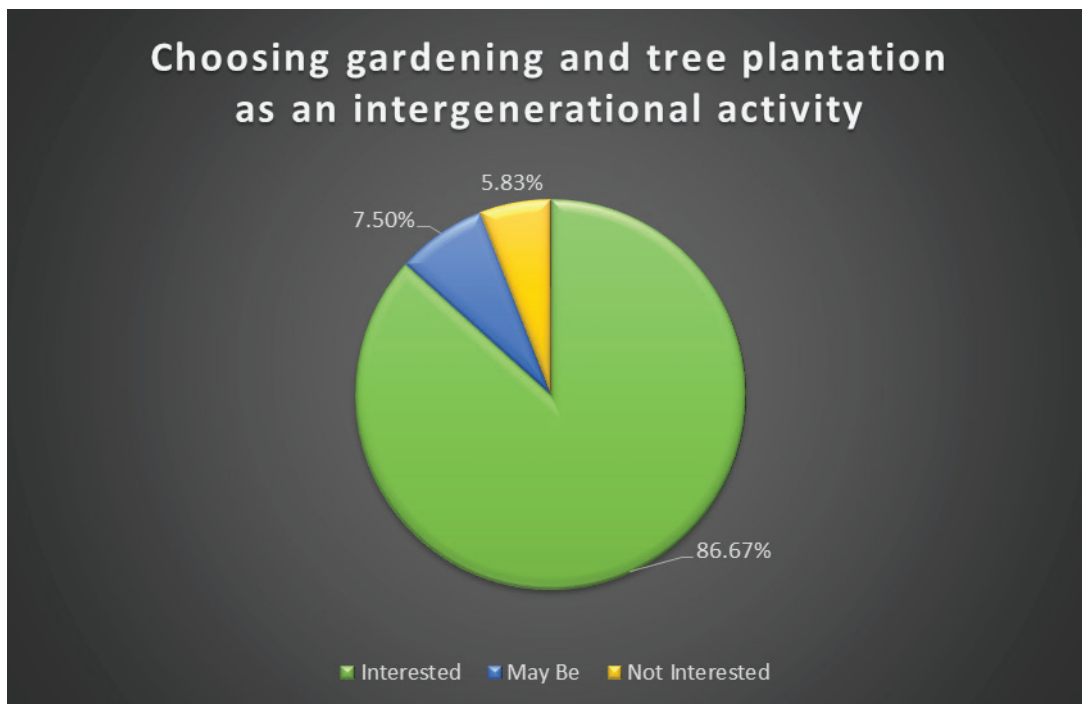


Fig 3: Choosing gardening and tree plantation as an intergenerational activity

Discussion

Various intergenerational activities have different impact on the people. We may look to attitudinal and behavioural measures for indicators of intergenerational community solidarity. Attitudes of youth towards elders are heterogeneous and may be positively or negatively affected by familial and nonfamilial intergenerational contact. [19, 20]

Y Fujiwara et al [21], in their study launched a new intervention study called REPRINTS in which senior volunteers were engaged in an activity of reading picture books to children. At the follow-up, social network scores (frequency of contact with grandchildren and others around the neighbourhood) and self-rated health was improved for majority of the individuals who did this activity most intensively as compared to those who did not. They concluded that this specific intergenerational activity helped in improving the mental and physical health of the older adults.

AL Park et al [8] studied the impact of intergenerational activities on general wellbeing of older adults. They recommended intergenerational activities for better health of the elderly.

CN Reisig et al [9] studied the perception of geriatric people of wellbeing after intergenerational experiences with youth while **Faer M et al** [10] conducted a large project on intergenerational activities, both of them recommended there should be intergenerational activities to maintain the health and wellbeing of people, both young and old.

We found out that majority of the participants interacted with the younger generations daily (55.83%) followed by 3 to 4 days a week (30%). General chit chat (56.67%), managing family business and farms (35%) and telling stories to grandchildren (32.50%), doing pooja – Bhajans (10%) were the common things done by the participants with their younger generations.

With increased urbanization and globalization, there is a reduced contact and also a marked reduction in the intergenerational bonding activities due to the migration of younger people for jobs in other cities. [22]

Whatever time these older people get to spend with their younger generations, should be spent in memorable

productive activities. What else can be more productive than planting trees together? The older generations can utilize their time in growing and nurturing saplings and trees at and around home, the younger generations can contribute their energy to plant these saplings in nearby areas.

We found out that 64 participants didn't have their own garden (53.33%), 79 participants never planted a single tree (65.83%). 107 participants felt that planting trees is necessary (89.17%). This indicates that with a little motivation and dedication these people can get involved in gardening and planting trees, which is the most important thing in today's era. [23]

Conclusion

Our study concludes that there are deficiencies in the intergenerational bonding activities. Various innovative and fruitful intergenerational activities should be developed, acted upon and followed to improve the physical, mental and social wellbeing of people from all the generations including old age people. Gardening and planting trees is one of such activity which people find important and are ready to follow.

Limitations:

Being a time bound study, follow up was not possible to check how many participants are actually involved in gardening and tree plantation as an intergenerational activity. A prospective study should be done to evaluate the impact and acceptance of this activity for intergenerational bonding.

Conflict of Interests: None

Source of Funding: Self

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Spectrum of Congenital Heart Diseases in a Tertiary Care Centre, Mysuru, Karnataka

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Abstract

Background: Congenital heart disease (CHD) is one of the common congenital lesions and the most common cause of heart disease in children. According to the World Health Organization, the incidence of CHD in India is 15% of all the cardiovascular disease.

Objective: To know the spectrum of congenital heart disease in a hospital set up.

Methods: A hospital based prospective study was carried out over a period of 16 months (Jan 2018– April 2019). All children below 14 years of age who were admitted with CHD confirmed by echocardiographic study were included in the study. Detailed history was collected. The age, sex, clinical presentation and echocardiographic findings were documented in a predesigned proforma.

Results: The total number CHD diagnosed were 113 and were more common among males (59.3%). The commonest type of acyanotic CHD in our study was atrial septal defect (ASD) (31.8%) and cyanotic CHD was tetralogy of Fallot (7.9%). The major clinical findings were the detection of tachpnoea (54.2%) followed by murmur(38.4%) , tachycardia (33.9%) .

Conclusions: Most CHD were diagnosed in infancy with tachypnea being the most common presentation with 73.5% of CHD were acyanotic CHD.

Keywords: Congenital heart disease, children, spectrum,

Introduction

Congenital heart disease (CHD) is defined as “a gross structural abnormality of the heart or intra-thoracic great vessels that is actually or potentially of functional significance”¹. The magnitude of the problem is considerable and is largely unrecognized, understated, and underestimated. The reported incidence of CHD is 8-10/1000 live births. The incidence of CHDs in India is increasing, probably due to increased birth rate, early and more accurate diagnosis because of diagnostic modalities, increased awareness amongst parents due

to the effects of social media^{2, 3}. The frequency of different major forms of CHD also differs greatly in various studies. The clinical presentation of CHD also varies according to the type and severity of the defect. The purpose of this study was to know the spectrum of heart diseases in children.

Material and Method

A hospital based prospective study was carried out in a teaching hospital to determine the spectrum of CHDs. The study was conducted for a period of 16 months from Jan 2018 to April 2019. All patients within the age range of 0-14 years, admitted in pediatrics department as well as the neonatal and paediatric intensive care units, newborns in postnatal wards with echocardiography diagnosis of CHD were included in the study.

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Patients from neonatal intensive care unit were subjected to echocardiography due to the appearance of murmur, cyanosis and tachypnea. Newborns in postnatal wards were screened for CHD based on presence of any one of 7 clinical parameters like family history, associated dysmorphism or congenital anomalies, respiratory distress, cyanosis, murmur, feeble peripheral pulses, tachycardia and pulse oximetry reading of less than 95% or more than 3 % difference between upper limb and lower limb between 24-72 hours of age.

Children diagnosed with CHD were analyzed further. Preterms with PDA were followed up and not included in this study if it closed spontaneously within the period of hospital stay or by managing conservatively. The presence and the type of CHD was confirmed by echocardiography. The data of all patients regarding age of presentation, gender, signs and symptoms, clinical features and echo findings were documented in a predesigned proforma.

Results

A total of 113 cases diagnosed with CHD were included in the study. 54.9% were newborns and 35.4% were between 1 month and 1 year of age. Males (59.3

%) were more commonly affected than females with the male to female ratio is of 1.5:1[Table 1 and 2].

Out of 113 patients, 52 (31.8%) were diagnosed with Atrial septal defect (ASD) which was the commonest type of CHD in our study, followed by 21(18.6%) patients of Ventricular septal defect (VSD), ASD with patent ductus arteriosus (PDA) and tetralogy of Fallot (TOF)(7.9%) in that order. (Table 3).

The commonest cyanotic CHD was TOF (7.9%) and was the third in frequency in our study (Figure 3). The major clinical findings were the detection of tachypnea (54.2%) followed by murmur (38.4%), tachycardia (33.9%), failure to thrive (12.4%) and cyanosis (11.3%) (Table 4).

In this index study, out of total 113 cases, the isolated acyanotic CHD was 83(73.5 %) and cyanotic was in 24(21.2 %).

Among the risk factors, bad obstetric history like previous abortions, still births, sibling deaths was noted in 18%, consanguinity in 10.2%, maternal gestational diabetes in 9% and pregnancy induced hypertension in 6.8 %.(Table 4)

Table 1: Age and sex distribution of children with congenital heart diseases

Types of CHD	Females	Males	Total (%)
Newborns	28	34	62(54.9)
1-12 months	13	27	40(35.4)
1-5 yrs	1	5	6(5.3)
> 5 yrs	4	1	5(4.4)
Total (%)	46(40.7)	67(59.3)	113 (100%)

In our study higher prevalence of CHDs in males (64%) as compared to female (36%)

Table 2: Distribution of various congenital heart diseases

Types of CHD	Males	Females	Total (%)
VSD	12	9	21(23.7)
PDA	4	2	06(6.8)
ASD	30	22	52(58.7)
COA	3	0	3(3.4)
TOF	4	5	9(10.2)
d-TGA	2	2	4(4.5)
Tricuspid atresia	1	0	1(1.1)
TAPVC	2	0	2(2.3)
DORV	4	1	5(5.6)
SINGLE VENTRICLE	0	2	2(2.3)
HLHS	1	0	1(1.1)
PAPVC	1	0	1(1.1)
Others (CARDIOMYOPATHY, ARRYTHMIAS	3	3	6(6.8)
Total	67	46	113(100%)

Table-3: Distribution of different presenting signs and symptoms

Symptoms	No of patients	Percent
Difficulty in breathing/tachypnoea	48	54.2
Tachycardia	30	33.9
Murmur	34	38.4
Cyanosis	10	11.3
Failure to thrive	11	12.4
Dysmorphisms/ congenital anomalies	24	27

Table-4: Association with different maternal risk factors

Risk factors	No. Of Patients	Percent
Maternal gestational DM	08	09
Maternal pregnancy induced Hypertension	06	6.8
Consanguinity	09	10.2
Bad Obstetric history (abortions, still births, sibling deaths)	16	18

Discussion

CHD is the most common congenital problem in children accounting for nearly 25% of all congenital malformations. and one of the major causes of infant mortality⁴. A recent systemic review pointed out that the highest prevalence of CHD reported from Asia (9.3 per 1000 live birth) and the least from Africa (1.9 from 1000 live birth)⁴. In contrast to other developed country, there are few Indian studies showing the prevalence of CHD. Available Indian studies had reported a wide variation in prevalence of CHD from 2.25 to 26 per 1000 live birth^{5,6}. There are few scattered study from north and south part of country but there is a paucity of data from this part of country.

Congenital heart disease were more common in newborns and between 1 month-1year (35.4%) similar to the study at other parts of our country⁷. In our study, the highest number of cases (90.3%) was seen in infancy as newborns were included in the study. In the present study, 54.2% of the patients presented with tachypnea followed by murmur (38.4%) and tachycardia (33.9%) similar to other studies where tachypnea was common presentation⁸.

The commonest type of acyanotic CHD was ASD (36.3%) which is quite a different observation compared to other Indian data^{5-7,9,12}. This may be attributable to over-diagnosis of patent foramen ovale as ASD as asymptomatic newborns were screened and included in the study. PDA was the third in the list (5.3%) among acyanotic CHD in our study. Tetralogy of Fallot was the commonest type of cyanotic CHD (7.9%) as reported by the several studies⁹. Some studies showed the male

preponderance of 2.08:1 and 1.78:1 similar to our study (1.5:1)^{10,11}.

In a study done in Mysore between 2001 and 2004 showed a prevalence of 10.65 per 1000 live births with VSD the most common CHD, followed by ASD, TOF and PDA¹³.

In this era, where we have the most accurate diagnostic modalities, any clinical suspicion of CHD should be confirmed by echocardiography. More doctors should be trained in diagnosing CHD by echocardiograph, so that CHD can be detected and treated earlier there by reducing morbidity and mortality. Fetal echocardiography should be advised liberally to the expectant mothers when one of the siblings is known to have complex CHD, family history of CHD or any other risk factors are present.

The prevalence of CHD is not uniform across the country as studies are done under different settings. Hence, it is important to determine the exact prevalence and case burden of congenital heart disease so that appropriate changes in health policies can be recommended.

Ethical Clearance- Taken from Institutional Ethical committee, JSSMC, Mysore

Source of Funding- Self/

Conflict of Interest - NIL

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A Retrospective Study on Risk Habits Associated with the Prevalence and Severity of Oral Submucous Fibrosis in the Indigenous Population of Andaman and Nicobar Islands

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Abstract

Introduction: Very few community-based studies are centered on the native population of India and to our best knowledge this study is the first of its kind that aims to throw light on the chewing patterns and its effect on patients suffering from OSMF in the indigenous population of Andaman and Nicobar. This study aims to correlate between tobacco associated adverse habits and prevalence & severity of OSMF in indigenous population of Andaman and Nicobar Islands.

Material and Method: The study was conducted in Port Blair, Andaman in June 2014. The study population consisted of 500 residents of age 22-84 years with known tobacco usage who were screened clinically.

Results & Discussion: Nearly 144 patients were diagnosed clinically with OSMF. Thus, a prevalence rate of 28.8%, which was comparatively higher to previous tribal studies in central India. This study is novel to the Andaman Islands and served as a potential tool to educate the natives on the tobacco consumption habits.

Keywords: *Andaman, Habit control, Oral submucous fibrosis, Awareness, Quality of Life*

Introduction

Oral submucous fibrosis is a chronic insidious potentially malignant disorder exclusively affecting the oral cavity and pharyngeal region with initial vesicle formation followed by epithelial atrophy and juxta-epithelial fibroelastic changes leading to fibrosis of oral mucosa and inability to open the mouth. Betel nut alkaloids consumed with or without tobacco, in the form of areca quid is a common practice in the Indian-subcontinent and prevalence of OSMF among them is high enough to be authorizing areca nut as the etiological agent in causation of OSMF. Tobacco in its chewing

and smoking form has been recognized as the major risk factor for oral cancer in India. ⁽¹⁾

The Andaman and Nicobar Islands comprises of a distinct population group of aboriginal tribes and migrants among whom tobacco chewing habit is rampant. Tobacco consumption is as high as 52% according to a study in 2011 among the tribal population in India, especially the lower socio-economic groups. ⁽²⁾ The advent of migrants from northern regions of India introduced commercial tobacco products into the society. Studies on the pattern of tobacco consumption and types of tobacco in this native population are lacking.

Very few community-based studies are centered on the native population of India and to our best knowledge this study is the first of its kind that aims to throw light on the chewing patterns and its effect on patients suffering from OSMF in the indigenous population of Andaman and Nicobar. Quality of life is vital health outcome

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measure that is relevant to patients, hence we also recorded the quality of life questionnaire from all the patients to suit the scenario. Apart from this subjective examination using VAS, questionnaires to evaluate the habit control and barriers to quit were also recorded.

Material and Method

Study setting and population: The study was conducted in Port Blair, Andaman in June 2014. The population comprised of Ranchi tribes resettled from Jharkhand region and Bangladeshi settlers resettled by the Government of India and non-settlers or migrants of Tamil, Telugu and Malayalam speaking origin. The study was conducted adhering to strict ethical protocol and written informed consent was obtained from the subjects prior to commencement of study.

Inclusion Criteria: The study population consisted of 500 residents of age 22-84 years with known tobacco usage who were screened clinically and 144 were diagnosed with Oral submucous fibrosis upon visual screening done by medical officers using criteria proposed by Bailoor and Nagesh et al.⁽³⁾ Age and gender

matched controls with no deleterious habits and absence of any clinically diagnosable premalignant disorders was chosen.

Exclusion Criteria: Clinically diagnosed patients with OSMF who were unwilling for incisional biopsy and patients already under treatment for OSMF were excluded from the study.

Subsequently the patient's personal history elicited tobacco consumption habits, frequency and duration of chewing among the OSMF patients. Symptoms such as burning sensation, restricted mouth opening and difficulty in swallowing were also recorded. Complete intra-oral and extra-oral examination was done and mouth-opening, check flexibility and protrusion of tongue was measured in accordance to methods proposed by Ranganathan et al.⁽⁴⁾

Functional staging was done according to Haider et al. Incisional biopsy was done after routine blood investigations, in order to confirm histopathological diagnosis and grading of OSMF was done in accordance to Pindborg et al.⁽⁵⁾⁽⁶⁾

Results and Statistical Analysis

Table 1 Association between Chewing habits duration/quantity and Oral Sub-mucous Fibrosis& Tumor staging

Chewing Habits duration (in Years)	OSMF	Other Lesions	Tumor Staging			p-value
			A	B	C	
No Habit	0	2	2	0	0	0.862
0 – 15	75	20	71	16	19	
16 – 30	16	10	15	0	0	
More than 30	4	0	25	0	0	
Chewing Habits Quantity	OSMF	Other Lesions	Tumor Staging			p-value
			A	B	C	
No Habit	0	1	1	0	0	0.969
1 – 10 packets	82	27	85	17	19	
11 – 20 packets	14	4	12	3	3	

Table 2: Association between Chewing Habits Quantity/Duration and Mouth Opening

Chewing Habits Quantity	Mouth Opening				p-value
	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	
No Habit	0	0	1	0	0.936
1 – 10 packets	17	19	67	18	
11 – 20 packets	3	3	8	4	
Chewing Habits duration (in Years)	Mouth Opening				p-value
	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	
No Habit	0	0	0	2	0.491
0 – 15	19	16	16	55	
16 – 30	3	4	5	15	
More than 30	0	0	0	4	

Table 3: Association between Smoking Duration/ Quantity per day and Functional Stage, Mouth Opening and Oral Sub-mucous Fibrosis.

Smoking Duration (in Years)	Functional Stage (p-value- 0.791)			Mouth Opening (p-value- 0.672)				OSMF (p-value- 0.535)		Other Lesion
	Stage A	Stage B	Stage C	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	Yes	No	
No Habit	76	17	20	20	17	20	56	81	8	24
0 – 15	9	2	1	1	2	1	8	6	2	4
16 – 30	11	1	1	1	1	1	10	7	2	4
More than 30	2	0	0	0	0	0	2	2	0	0
Smoking Quantity per day	Functional Stage (p-value- 0.600)			Mouth Opening (p-value- 0.365)				OSMF (p-value- 0.059)		Other Lesion
	Stage A	Stage B	Stage C	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	Yes	No	
No Habit	76	17	20	20	17	20	56	81	8	24
1 – 10 packets	16	2	2	2	2	2	14	10	2	8
11 – 20 packets	6	1	0	0	1	0	6	5	2	0

Table 4: Quality Of Life Questionnaire

Method	Coefficient of correlation
Cronbach alpha	0.90
Split – half reliability	0.85

Table 5: Questionnaire for habit control (A), Barriers to Quit the Habit(B) and Subjective Examination(C)

A		
Habit Control		
S.no	Question	Yes (Percentage)
1	Are you willing to quit the habit	69
2	Are you aware of withdrawal symptoms [irritability, anxiety, restlessness, increase appetite, headache, insomnia, depression, constipation, increased cough]	54
3	Are you aware of nicotine replacement therapy (NRT)	33
B		
Barriers To Quit The Habit		
S.no	Reason	Response In Percentage
1	Tried to quit but never worked	16
2	Stress	39
3	Dependence	23
4	Compulsion	11
5	Don't know "How to say No"	7
6	Do it When "I am Bored"	4
C		
Subjective Examination –Vas		
S.no	Patiency Response	Percentage
1.	No Pain	8
2.	Mild, annoying pain	12
3.	Nagging,uncomfortable,troublesome pain	32
4.	Distressing, miserable pain	29
5.	Intense, dreadful,horrible pain	14
6.	Worst possible, unbearable,excrtiating pain	5

Discussion

In our study of 500 patients with tobacco habits were included after initial screening and 144 were diagnosed clinically with OSMF. Thus, a prevalence rate of 28.8% was comparatively higher to previous tribal studies in central India by Kanna et al who provided prevalence of 6.3% (2004) and 7.2% in tribes of wayanad (2013).⁽⁷⁾⁽⁸⁾ In the previous studies Leukoplakia was the major

oral disorder among tobacco abusers and smoking was more predominant with beedi smoking being the chief habit. Since among our population of native Andaman tribes smokeless tobacco and areca nut chewing was rampant as compared to smoking form of tobacco our study reflects a higher prevalence rate of OSMF.⁽⁹⁾

The patients diagnosed with OSMF were in the mean age of 34.7 years which is consistent with previous

studies by Haider et al (2000).⁽¹⁰⁾ This is much higher compared to studies conducted in 2009 by Ceena et al where they found the average age range was 26 years and majority of cases were in the age range of 21-30 years thereby concluding that the younger age group was more susceptible to both areca chewing habit and occurrence of OSMF.⁽¹¹⁾ Previous tribal studies have shown a high prevalence of 52.07-63% of smokeless tobacco use among the adolescent population with mean age range of 13-49 years with average age of initiation of smokeless tobacco use being at least 13.7 years.⁽¹²⁾⁽¹³⁾ The difference in the distribution among our study population can be attributed to it being majorly migrated population now native to the island for few decades, and indigenous tribes. The mean age of occurrence of OSMF seems to be a decade away from mean age of initiation of smokeless tobacco habit.

Among the OSMF patients 37% were females and 63% were males thus showing a male predominance similar to studies by Ranganathan et al and Pandya et al (2009).⁽¹⁴⁾⁽¹⁵⁾ Nevertheless studies by Jhonson et al (2000) showed female preponderance among OSMF patients. To best of our knowledge no studies have analyzed OSMF prevalence among native population in Andaman and Nicobar Islands.

Among the 500 smokeless tobacco chewers the most prevalent habit was chewing of indigenously made Paan masala with tobacco (36.4%) followed by Supari and Zarda. Areca-nut chewing (15%) was more popular among the female population. Among the 140 OSMF patients 51 patients chewed Paan alone or in combination with other habits. Paan is a combination of areca-nut catechu, lime and flavoring agents and chewed along with betel leaf at homes or available as commercial mixtures along with tobacco. Areca nut alone causing OSMF was previously documented in studies by Van Wyke et al.⁽¹⁶⁾ Since these mixtures are predominantly prepared by self, they tend to consume more dry weight of areca-nut which further induces fibrosis of oral mucosa at an earlier stage and consuming them for longer periods causes addiction and dependency.

The presence of burning sensation was the most prevalent complaint of OSMF patients (72.8%) and most common cause of reporting to a dental check-up following which 46.4% of patients complained of

difficulty in mouth opening while 12.85% presented with no previous symptoms and were unaware of suffering from the disease.

Among the OSMF patients 102 had mouth opening \geq 20mm which is comparable to previous study by Ara et al, 16 patients had mouth opening of 11-19mm and 22 patients suffered from mouth opening less than 10mm.⁽¹⁷⁾

Among the OSMF patients 53.6% had chewing habits for a duration of <15 years and 11.4% from 16-30 years only 4.2% of habits greater than 30 years developed OSMF. The association between duration of tobacco chewing and advent of OSMF in these patients were compared by chi-square was not significant ($p=0.089$). Among them majority of the patients who chewed <10 packets of smokeless tobacco were classified as Stage A of OSMF according to functional staging (60.7%) while the 13.6% of patients with chewing habits between 10-20 packets predominantly developed Stage C OSMF. These results are comparable to previous studies by Ahmed et al who also found that severity of OSMF increased in correlation to the frequency and duration of smokeless tobacco abuse.⁽¹⁸⁾ In other studies by Rajendran et al they deduced that though frequency or no. of packets of smokeless tobacco had direct relationship with the severity of OSMF the duration of chewing was irrelevant to the development of the disease.⁽¹⁹⁾ In our study we noticed that OSMF developed predominantly in younger population with lesser duration of chewing habits hence emphasizing the inherent toxic nature of the Paan and other smokeless tobacco products. Similarly, Shah et al hypothesized that the burden of exposure of toxic products at a period affected the development of OSMF in these models.⁽²⁰⁾ The relationship between chewing habit duration and mouth opening in OSMF patients was studied using chi-square and they gave a significant relationship with increase in duration of chewing showed reduced mouth opening among OSMF patients ($p=0.004$).

On correlating clinical staging and histological grading, analysis with Chi square test was not significant with $p>0.05$ which is like a study by Syeda Arshiya Ara et al who also found no significant relationship between histological grading and functional staging in OSMF. While studies by Kiran et al and Pandya et al, found

significant relation between the staging and grading these differences in results can be attributed to factors such as site of OSMF, fibrosis at the time of staging, duration of disease at time of assessment and the differences in system of assessment used. ⁽²¹⁾

Several “quality of life” questionnaires have been developed over the past, however to our knowledge there are no questionnaire to suit the Andaman population. Keeping this in mind we aimed at developing a standardized QOL questionnaire to fulfill all the domains of life. The KMO score was 0.86 which shows that the sample was adequate for factor analysis. Hence can be concluded that the present QOL is a multidimensional construct with many factors within it.

Apart from the QOL questionnaire even Habit control, Barriers to quit habit etc were taken into consideration (Table 5). Around 69% of the study population were willing to quit the habit, Major barrier for quitting the habit was stress (39%) and dependence (23%). The study results would be a valuable piece of information for public health personnel to enlighten the population about the ill effects of the deleterious habit and about the dreadful disease that they would encounter.

Conclusion

The duration of tobacco chewing significantly affects the severity of mouth opening and in turn the levels of fibrosis in OSMF patients. However, the comparison of functional and histopathological lesions was of little use in our study and clinical indicators are a more reliable marker of the disease when compared to functional staging. This study is novel to the Andaman Islands and served as a potential tool to educate the natives on the tobacco consumption habits. Since our study concentrated on a smaller sample in one region of the Andaman Islands it needs to be expanded to cover more geographical and ethnic population to provide promising results in addressing the tobacco challenge in these regions.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical clearance was obtained from SRM Institutional Review Board.

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Status of Oxidative Stress in Patients of Chronic Obstructive Pulmonary Disease

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is the major cause of death worldwide. It is projected to be third leading cause of death globally by 2030. Reactive oxygen species plays important role in pathophysiology of COPD. High ROS generation resulted in increased lipid peroxidation. MDA which is a biomarker to evaluate the level of lipid peroxidation is used to evaluate the oxidant antioxidant level in COPD patients. Significant difference between COPD patients and healthy subjects is found in our study. It is concluded therefore, that a biomarker-based (preferably MDA) study can be utilized to assess the efficacy of novel antioxidant or other agents in modifying the course of this disease.

Key Words: COPD, Oxidative stress, MDA, Free radicals, Lipid Peroxidation

Introduction

Chronic obstructive pulmonary disease (COPD) is one of the big reason of morbidity and mortality worldwide. It is a major public health problem and is projected to rank third leading cause of deaths globally by the year 2030¹. An imbalance between oxidant antioxidant play an important role in pathophysiology of COPD²⁻⁴. One of the results of increased ROS generation is increased lipid peroxidation. It involves free radical chain reactions leading to the decomposition of polyunsaturated fatty acids, constituting, for example, the components of cell membranes⁵. In this process, once a hydrogen atom is detached from a polyunsaturated fatty acid molecule, a reconfiguration of double bonds occurs and leads to the generation of conjugated dienes (CDs)^{6,7}. Among the secondary products of lipid peroxidation, generated as a result of further reactions, (e.g., β -elimination and decomposition of polyunsaturated fatty acid derivatives), are aldehydes,

mainly malondialdehyde (MDA)⁸. The present study was undertaken to evaluate the oxidant anti oxidant levels in COPD patients.

Materials and Method

Study subjects

20 Stable cases of COPD are recruited in the study. 10 healthy subjects with no pulmonary, cardiovascular, or oncological disease, inflammation, infection, and neurological dysfunction that could influence the oxidative status were enrolled as controls.

COPD was defined according to the Global initiative for Chronic Obstructive Lung Disease (GOLD) criteria⁹. Subjects with history of tuberculosis, bronchial asthma, diabetes mellitus, hypertension, lung cancer, cardiovascular, renal diseases, chronic hepatic failure, and prior antioxidant intake were excluded from the study. The study was approved by institutional ethical committee and is in accordance with ethical standards outlined in the Declaration of Helsinki. Detailed written and informed consent was taken from all subjects.

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Marker of Oxidative stress

The levels of serum lipid peroxidation products i.e., thiobarbituric acid (TBA-MDA) was measured spectrophotometrically at 630 nm by the modified Birgül method (2005) The concentrations of lipid peroxidation products was calculated as MDA concentration, using the extinction coefficient for the MDA-thiobarbituric acid complex of $1.56 \times 10^5 \text{ M}^{-1}$ for calculation¹⁰.

Statistical Analysis

The results were presented in mean \pm standard deviation and percentages. The Chi-square test was used to compare the categorical variables. The unpaired *t*-test was used to compare two discrete variables. The $P < 0.05$ was considered statistically significant. All the analyses were carried out using SPSS 16.0 version (SPSS Inc., Chicago, IL, USA).

Results and Discussion

The mean age of the study population was 45 ± 10 Baseline demographic and Clinical characteristics are shown in [Table 1]. Majority of the subjects in our study population were male. Almost all the COPD patients (90%) were smokers. , out of the controls 50% were smokers and 50% were non-smokers. Majority of the patients were in GOLD Class 2 (60%). Cough and breathlessness were predominant symptoms in study patients.

Results of biomarker analysis of the study are presented in [Table 2]. MDA levels, which is a marker of oxidative stress, were significantly higher in COPD patients than controls (7.21 ± 1.9 vs. $0.51 \pm 0.29 \text{ nmol MDA ml}^{-1}$, $P = 0.0001$) . Also when compared the plasma level of MDA was found significantly higher in males compared to females [$P = 0.001$]

All these data point toward a greater oxidative and anti-oxidative imbalance in males when compared to their female COPD counterparts.

Among patients with COPD, the mean level biomarker of oxidative stress ;MDA were higher in smokers compared to nonsmokers [$P = 0.001$], All these data corroborate with a greater oxidative and anti-oxidative pathway imbalance in smokers. However, nonsmoking COPD patients still have significantly

higher values of oxidative markers compared to their non-COPD counterparts.

There was no difference in oxidative stress marker according to site of enrolment – outpatient, inpatient, or intensive care setting. This implies that oxidative stress is prevalent at all stages of COPD.

Of the various symptoms, the presence of cough significantly correlated with higher levels of MDA ($P = 0.001$). Cough also more frequent in high COPD severity grades than lower grades ($P = 0.04$). This could explain the relationship of cough and higher levels of oxidative stress in the study.

Our study results support the oxidant and antioxidant imbalance theory of COPD. Lungs are exposed to large amount free radicals. Reactive oxygen species that are produced has the direct correlation with oxidation of proteins, DNA, and lipids. Membrane lipids are highly vulnerable to free radical damage which is very much harmful for the cell function. MDA is a product of lipid peroxidation and an indirect measure of free radical activity in body. As free radical injury increases lung function decreases. Oxidative stress is reported to play an important role in the pathophysiology of COPD. The aim of the present study was to evaluate the oxidant-antioxidant imbalance in healthy controls and COPD group. The levels of oxidative marker such as MDA were significantly higher in COPD patients when compared with controls. Various studies have similarly found significantly raised levels of MDA in patients of COPD when compared to healthy controls^{11,12} . Gender and smoking had judicious effects on oxidative stress. In our study, males had higher plasma level of MDA compared to females. The more frequency of smoking and high environmental exposure might be the reason for this difference. Smokers COPD patients in our study had higher level MDA marker when compared to non smokers. It is because cigarette smoke is the main generator of oxidative free radicals¹³. Although, COPD non-smoker patients do continue to have oxidative stress from other sources such as respiratory infections, inflammation, dust, and air pollution. With increasing grades of GOLD class for COPD severity, the levels of MDA were progressively increased. The presence of cough indicated high-oxidative stress and diminished antioxidants. Our study and various studies^{14,15}

mentioned clearly prove the point that MDA is the marker which has consistently shown correlation with disease severity.

The understanding of COPD has undergone a paradigm shift in recent years. It is thought to be a systemic disease associated with extrapulmonary manifestations such as cardiovascular disease, diabetes, obstructive sleep apnea, and metabolic syndrome¹⁶. Even subclinical atherosclerosis is common in COPD patients contributing to overall COPD morbidity¹⁷. Oxidative stress can be the only plausible common pathogenetic

link between COPD and other systemic manifestations.

COPD is a chronic disease without any disease modifying therapy till date. Oxidative stress is potential mechanism which can be altered to halt its progression. A biomarker-based (preferably MDA) study can be utilized to assess the efficacy of novel antioxidant or other agents in modifying the course of this disease.

The primary limitations of the study include smaller sample size and lesser number of healthy volunteers compared to diseased subjects.

Table 1: Baseline demographic and clinical parameters of the study subjects

Age (in years)	Cases (20)	Control (10)	P value
30	4	2	0.0001
30-40	5	4	
40-50	8	4	
50-60	3	0	
Male (%)	16 (80%)	7 (70%)	
Smokers	18 (90%)	5 (50%)	
Symptoms			
Cough	16	0	NA
Breathlessness	20	0	
Fever	2	0	
COPD Stage			
1	5(25%)	0	NA
2	12 (60%)	0	
3	3 (15%)	0	
4	0	0	

Table 2: Comparison of biomarker between cases and control

Marker (nmol ml-1)	Cases (20)	Control (10)	P value
MD A	7.21± 1.9	0.51 ± 0.29	0.0001

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Anatomical study of Variations of Median Nerve and Musculocutaneous Nerve in the Arm

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Abstract

Background: The variations related to the median nerve and musculocutaneous nerve are relatively less common. The variations may have potential clinical implications especially during surgeries and nerve blocks.

Materials and Method: The routine dissection of 50 adult cadavers including 42 males and 8 females in the Department of Anatomy during undergraduate training was carried out to detect the variations in the structure, formation and relation of Median nerve and musculocutaneous nerve.

Results and Findings: There was a variation observed in the formation of median nerve in three adult cadavers. In three male cadaver, there was unilateral variation in the formation of the median nerve by more than two roots. However, in each of these cadavers the distribution of the median nerve was normal in arm, forearm and palm. There was normal pattern of formation, relation and course of Median nerve in rest of the cadavers. Absence of musculocutaneous nerve, and nerve not piercing coracobrachialis, and communication between median and musculocutaneous nerve was found. Photographs of abnormalities were taken for proper documentation of the variations.

Conclusion: These variations have been explained by some embryological facts available. These variations of formation of median nerve are clinically important for physicians, surgeons and anesthetists because symptoms of median nerve compression due to these variations are often confused with radiculopathy and carpal tunnel syndrome. The knowledge of variations of musculocutaneous nerve is important to the surgeons and anesthetists' for carrying out surgical procedures and nerve blocks in axilla and arm.

Key Words: *Median nerve, Musculocutaneous nerve, Brachial plexus variations.*

Introduction

The median nerve is formed by the union of medial root from medial cord (C8, T1) and lateral root from lateral cord (C5-C7) of brachial plexus anterior or lateral to the third part of Axillary artery.

In the arm the nerve passes at first lateral to brachial artery crosses to the medial side from front of

it descending down to the cubital fossa. No branches of median nerve are found in the arm.¹¹

Similarly Musculocutaneous nerve is a branch of lateral cord pierce the coracobrachialis and gives branches which supplies all the muscles of arm.

In close to the cubital fossa, it lies lateral to the biceps tendon and anteriorly to the brachialis muscle that becomes known as the lateral antebrachial cutaneous nerve (or the lateral cutaneous nerve of forearm) which supplies common sense of the skin in anterolateral region of the forearms as far distally as the base of the thenar eminence¹.

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The MCN entrapment is rare. It can occur due to an inadequate positioning of the arm during sleep because the CbM and BM act as anchor point for MCN. If this situation coexists with a communicating branch where a part of MN passes through CbM, the clinical signs could be similar to those found in MN neuropathy in the hand. The diagnosis of MCN-MN communication in this clinical presentation by electromyographic methods could prevent unnecessary releases of the carpal tunnel.

The knowledge of anatomical variations of these nerves is important as these nerves could be injured during surgical procedures and because variation may explain unusual clinical symptoms.⁷

The present study is aimed at assessing the variations of median and musculocutaneous nerves in the arm and their clinical correlations.

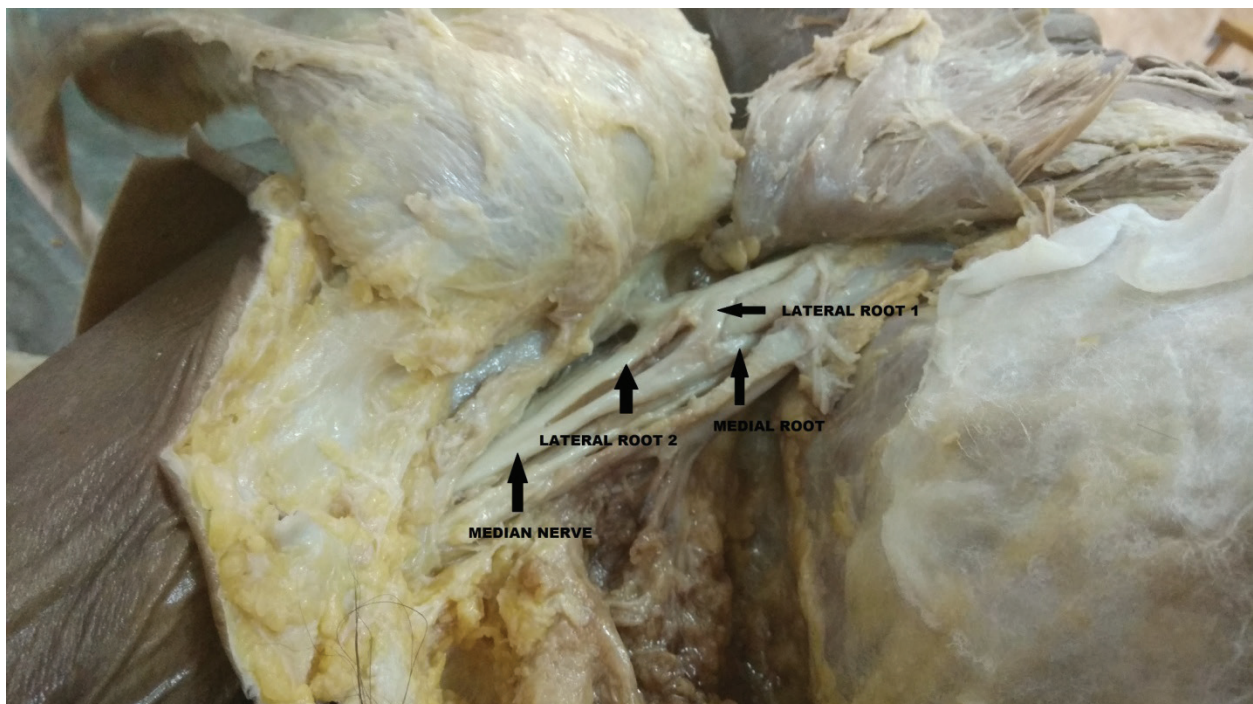
Materials and Method

The present study was conducted on 50 limb (42 male and 8 female) specimen during routine dissection

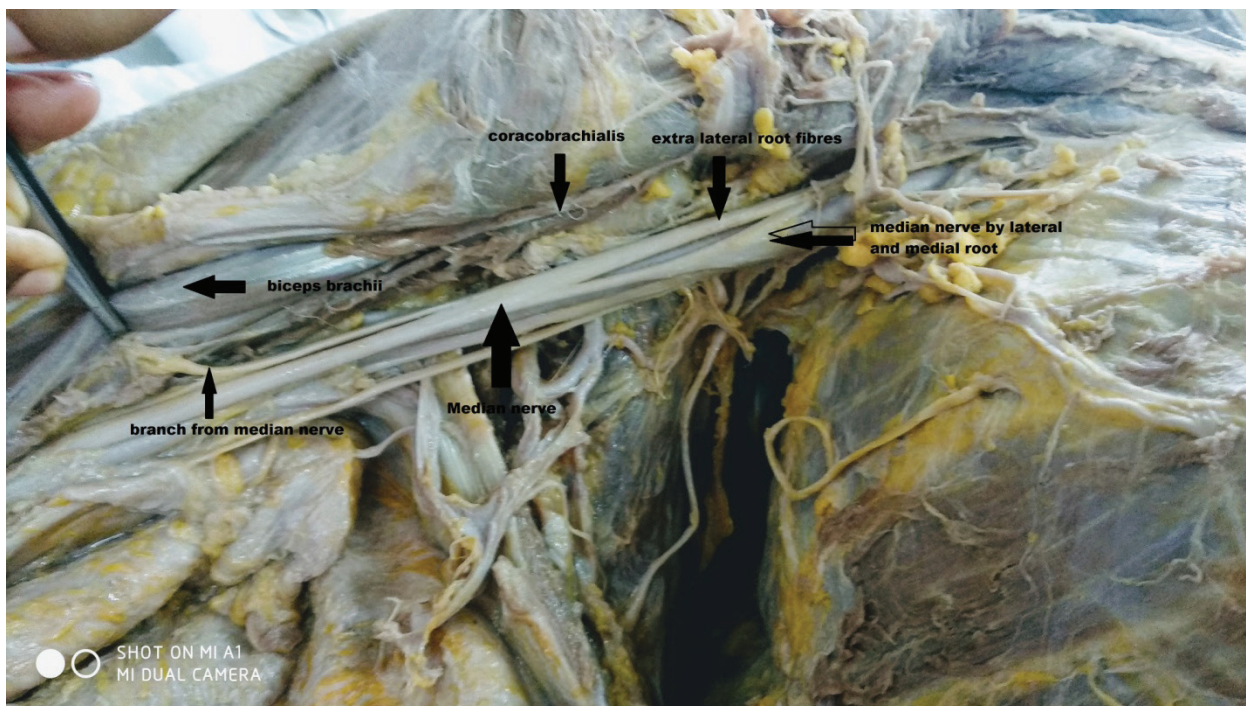
for MBBS students. The Axilla and Arm were dissected in the anatomy department of the JSS Medical College, Mysuru, India, over a period of 2 years. The cadavers were embalmed and preserved in a weak formalin solution. The infraclavicular part of the brachial plexus was dissected according to the guidelines of the Cunningham's manual of Practical Anatomy. During the dissection, The variations of Median nerve, Musculocutaneous nerve in the arm were noted, the normal pattern, as well as variations from the normal pattern, were noted and photographed. The number of the variations was noted and the result was tabulated using a regular statistics method. Any variations from normal was noted and tabulated (► Table 1).

Results

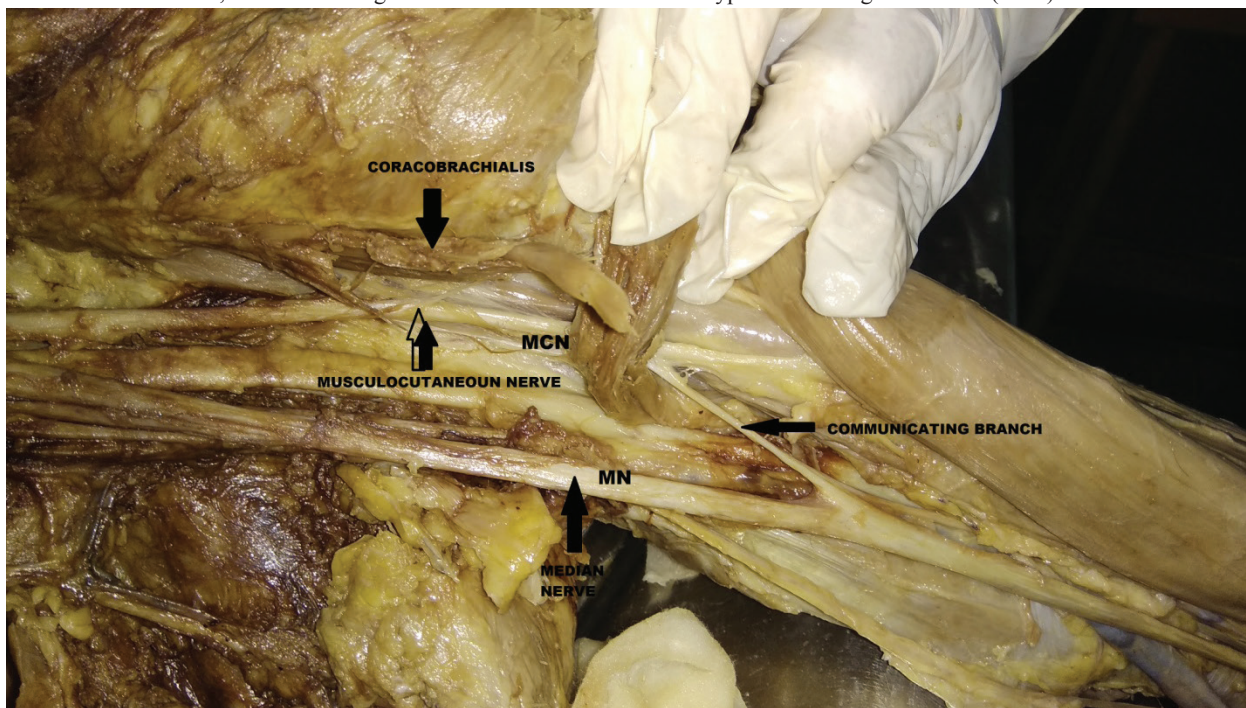
1) Formation of the median nerve by three roots was seen in 1 out of 50 specimen. Out of the three roots of median nerve, two roots was given by the lateral cord of the brachial plexus and one root was given by the medial cord of brachial plexus as seen in ► Figure 1.



2) Absence of the musculocutaneous nerve was seen in 1 out of 50 specimen. In the absence of the musculocutaneous nerve, the muscles of the anterior compartment of the arm were innervated by the branch coming from median nerve as seen in ► Figure 2. This variation comes under type v as described by Li Minor(1990).



3) Communication between the median and the musculocutaneous nerves was seen in 2 specimens out of 50. The communication was in the middle of the arm, as seen in ► Figure 3 This variation comes under type II according to Li Minor(1990).



4) Musculocutaneous nerve was arising normally from the lateral cord traversing between coracobrachialis and biceps brachii, then between biceps brachii and brachialis supplying all three muscles. Here the variation noted was musculocutaneous nerve not piercing coracobrachialis seen in 1 out of 50 specimen. It is one of the very rare variation found. ► Figure 4(MCN- musculocutaneous nerve, MN- median nerve, Br- brachialis muscle)

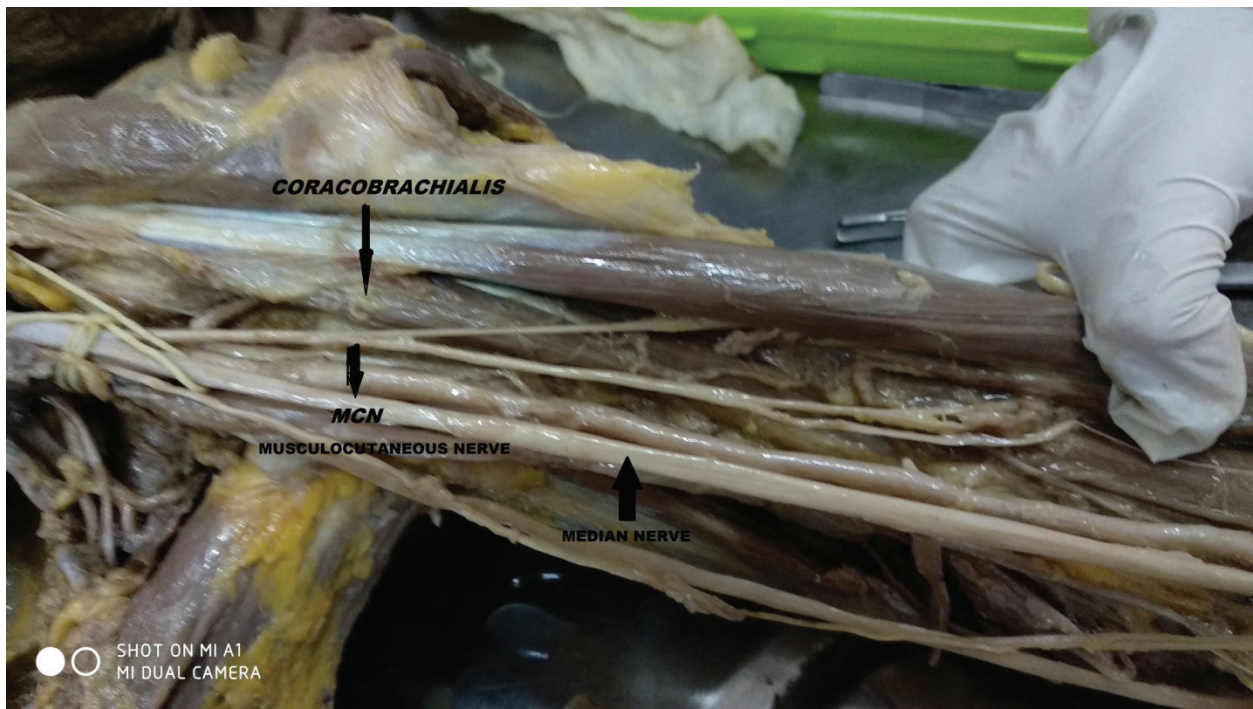


TABLE NO 1: Showing all the variations observed

Specimen No	Variation observed	No of Variation, n=50	Percentage of variation
1	Formation of the median nerve by three roots	3	6%
2	Absence of the musculocutaneous nerve	1	2%
3	Communication between the median and the musculocutaneous nerves	1	2%
4	musculocutaneous nerve not piercing coracobrachialis	1	2%

TABLE NO 2: Comparison between the previous studies

Author	year	Sample size	Absent MCN	Innervation by Median Nerve	Communication between median nerve and MCN	MCN not piercing Coracobrachialis
Dr Shashank M J	2014	40	5%	Present in the arm	-	-
Abhilasha Priya	2019	60	5%	Present in the arm	13.33%	-
Virendra Budhiraja	2011	116	11.2%	Present in the arm	20.7%	-

Cont ... TABLE NO 2: Comparison between the previous studies

Amrita Bharati	2015	10	-	Formation from 3 roots- 2%	-	-
K Lakshmi Kumar	2015	106	-	Formation 3 roots- 26.41%, 4roots- 1.88%	-	-
Parminder Kaur	2014	30	13.2%	Present in the arm	-	-
Present study	2019	50	2%	Formation 3 roots- 6%	4%	2%

Discussion

Variations of the lateral cord are not rare and have been reported by many authors in the past as seen in table 2. On the basis of embryological development, anomalous pattern of the median nerve and musculocutaneous nerve can be explained. The upper limb buds lie opposite the lower five cervical and upper two thoracic segments. As soon as the buds form, the ventral primary rami of the spinal nerve penetrate into the mesenchyme of limb bud. Immediately, the nerves enter the limb bud and they establish intimate contact with the differentiating mesodermal condensations. The early contact between nerve and muscle cells is a pre-requisite for their complete functional differentiation. The growth as well as the path finding of nerve fibres towards the target is dependent on concentration gradient of a group of cell surface receptors in the environment. Several signaling molecules and transcription factors have been identified, which induce the differentiation of the dorsal and ventral motor horn cells. Misexpressions of any of these signaling molecules can lead to abnormalities in the formation and distribution of particular nerve fibres^{1,2,11,12}.

At the infraclavicular level, the lateral fascicle of the brachial plexus usually bifurcates giving origin to the musculocutaneous nerve (MCN) and the lateral root of the median nerve (MN). However, during the embryological development process it is possible that bundles of fibers corresponding to the MN initially

run together with bundles of fibers of the MCN. The MN recovers the fibers required to perform its motor and sensorial functions in the upper extremity, only when the bundles of fibers were connected with their nerve of origin (MN) at the proximal or mid-thirds of the arm. Although with low frequency, fibers of the MCN have also been seen to initially run along of the MN and later reestablish their configuration through a communicating branch.¹⁻⁵ The incidence of the MCN-MN communication has been reported in diverse population groups with a wide variability between 2.1 and 63.5%.⁵⁻⁸ The majority of the studies only report the MCN-MN communication. Maeda et al.³ and Chiarapattanakom et al.⁶ have reported an occurrence of 3-6.8% for the communication from the MN to the MCN. Information about the prevalence of side of MCN-MN communication is low. Few studies report predominance of the left side and of the unilateral expression of this communicating branch.^{4,9,10} Several ways to classify this communicating branch have been proposed by the wide variability in its expression.^{3,7,8,10,11} Knowledge of the existence of the MCN-MN communication in the arm is clinically important.¹⁴

Communications between MN and MCN have been described to the five types^{8,1,2}

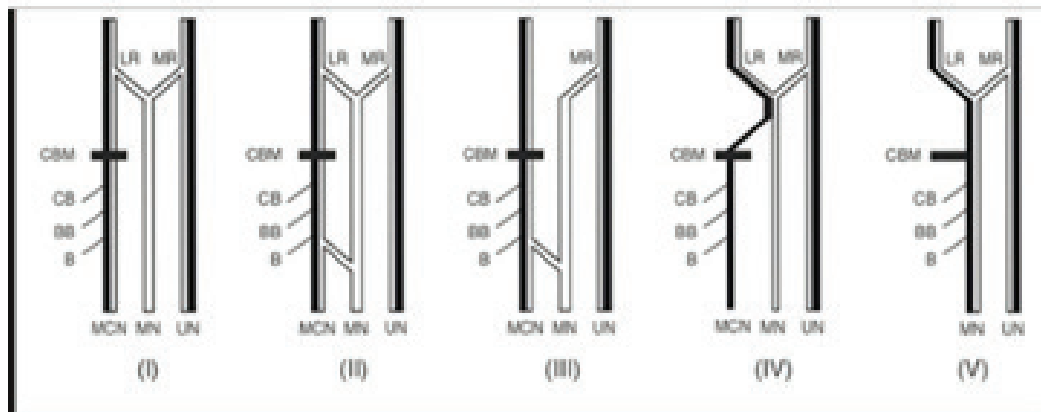
- ▶ Type I-There is no communication between median nerve and musculocutaneous nerve.
- ▶ Type II- Some fibres of lateral root of median

nerve pass through musculocutaneous nerve and join median nerve in the middle of the arm.

▶ Type III- All the fibres of lateral root of median nerve pass along musculocutaneous nerve and after some distance leave it to form the lateral root of the median nerve

▶ Type IV- Musculocutaneous nerve joins the lateral root of median nerve and after some distance the musculocutaneous nerve arises from the median nerve.

▶ Type V- Musculocutaneous nerve is absent and entire fibres of musculocutaneous nerve pass through lateral root of median nerve to median nerve. The fibres to the muscles supplied by musculocutaneous nerve branch out directly from the median nerve.



Classification of variations of the median nerve and the musculocutaneous nerve according to Le Minor (1990). CBM: Position of the coracobrachialis muscle; CB: coracobrachialis ramus (nerve); BB: Biceps brachii ramus; B: Brachialis ramus; LR: Lateral root forming the median nerve; MR: medial root forming the median nerve; LC: lateral cord; MR: medial cord; MCN: Musculocutaneous nerve; MN: median nerve; UN: ulnar nerve.

In the present study, formation of the median nerve by three roots was noted in 3 out of 50 cases (6%). In all of these cases, two roots were coming from the lateral cord, and one root from the medial cord. In one case, there was also communication between the median and the musculocutaneous nerves. A similar case of formation of the median nerve by three roots was described by Anju Bala¹², K Lakshmi Kumari¹¹ in 26.41% and Amrita Bharti¹⁵ in 2% cases. K Lakshmi Kumari¹¹ has reported median nerve which is formed by 4 roots in 1.88%.

Dr Shashank M J³, Abhilasha Priya⁴, Virendra Budhiraja⁷, Parminder Kaur², Charushila D Shinde⁶ have observed absence of Musculocutaneous nerve in

5%, 5%, 11.2%, 13.2% cases respectively. Whereas in our study it was found to be 2%.

Arian Azimi⁵ found a variation in which lateral cord was giving off MCN which was small and thin and needed to be looked carefully to find it in the macroscopic dissection, then the lateral root continued as the lateral root of median nerve innervating the muscles of arm.

Communication between Median and Musculocutaneous nerve after piercing or without piercing coracobrachialis muscle is quite common compared to other variations as per the results of previous studies (by Virendra Budhiraja⁷, Abhilasha Priya⁴, Hamid Tayefi Nasrabadi¹). The same is been tabulated in Table No 2.

Musculocutaneous nerve not piercing Coracobrachialis without communication with median nerve is one of the rare variation, which we found in our present study.

The MCN injury proximal to the MCN-MN communication can lead to an unexpected weakness of the forearm flexor muscles and thenar muscles with clinical signs like seen in a MN injury at the level of the

arm. Furthermore, the MN injury proximal to the MN-MCN communication can lead to a clinical presentation characterized by functional preservation of forearm and hand muscles innervated by MN. In the peripheral nerve surgery, especially in nerve transfers techniques, a good knowledge of the MCN-MN communications is required.

Conclusion

The MCN has been successfully used as a receiver nerve to the recovery of elbow flexion. Furthermore, the MCN motor branch to BrM has been used as donor to anterior interosseous nerve and posterior interosseous nerve for the treatment of lower brachial plexus injuries as well as in the treatment of tetraplegic patients.

The high median nerve entrapment symptoms may be used in differential diagnosis of unexplained clinical symptoms like sensory loss, pain, wakefulness and paresis. The knowledge of such rare median nerve variations is thus important for anatomists, anesthetists, radiologists and surgeons.

The knowledge of such variations is of much interest to Anatomists and Surgeons. Anatomical variations are significant during exploration of axilla and arm surgeries involving neoplasms and other vascular masses.

Conflict of Interest: No

Ethical Clearance: Has been taken from the ethical committee, JSSMC, Mysuru

Source of Funding: Self

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Demographic Trends and Outcome of Acute Poisoning in a Rural Tertiary Care Hospital of Nalgonda District, Telangana

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Abstract

Background: World Health Organization (WHO) estimates that, globally more than three million of acute poisoning cases with 2,20,000 deaths occur annually. Of these, 90% of fatal poisoning occurs in developing countries particularly among agricultural workers. It has been reported that acute poisoning approximately constitutes 10% of admission in medical emergency departments in India. **Objectives:** 1. To assess the patterns of socio-demographic variables of patients admitted with acute poisoning in a rural tertiary care hospital 2. To determine the various poison related factors in relation to the outcome of patients admitted with acute poisoning in a rural tertiary care hospital of Nalgonda district. **Methodology:** This was a retrospective record based study conducted using patient's discharge summaries comprising of the patients admitted to the emergency medicine department for acute poisoning from July 2019 to January 2020. Data was entered and analyzed using Microsoft Excel 2010. **Results:** During the study period, a total of 77 acute poisoning cases were admitted, with 5 deaths, resulting in a mortality rate of 6.5%. Acute poisoning was most seen in males (58.4%) and in the 14 to 30 years (62.3%) age group. Majority of the patients were admitted for ingestion of poison (89.6%) and the most commonly consumed poison was insecticides (40.3%). **Conclusion:** Insecticide poisoning is the most common form of poisoning with high mortality among males. There is a need for appropriate training and counselling sessions of preventive strategies for individuals who are at risk of acute poisoning especially the younger age groups.

Keywords: Acute poisoning, Rural, Insecticide, Suicide, Pattern

Background

Acute poisoning forms one of the most common causes of emergency hospital admissions. It has been reported that acute poisoning approximately constitutes 10% of admission in medical emergency departments in India.¹ Cases of poisoning depend on availability of poisons, socio economic status, religious and cultural influences, occupation prevalent in the region and likewise. It is estimated that upto half a million population die every year as a result of poisoning, particularly due to pesticide poisoning.² Poisoning is the fourth common cause of mortality in rural India.³ World Health Organization (WHO) estimates that, globally

more than three million of acute poisoning cases with 2,20,000 deaths occur annually.⁴ Of these, 90% of fatal poisoning occurs in developing countries particularly among agricultural workers.⁵

The pattern of poisoning in our country differs from that in the Western countries. In our country, Organophosphorus insecticides take the lead by great majority, in the west it is the tranquilizers, hypnotics and sedatives which are most frequently used in self poisoning.⁶ Easy availability of numerous poisonous substances due to rapid development in science and technology, vast growth in industrial and agricultural set up has tremendously increased the incidence of

poisoning cases. A number of chemical substances, which were developed to save the agricultural products from rodents and pests so as to protect the human from starvation, are in fact themselves becoming man eaters.⁷ Reducing deaths due to poisoning requires effective medical management of acute poisoning. Knowledge about poisoning cases pattern in region is important for early diagnosis and prompt treatment. This is essential for introducing the new and evaluating the old preventive measures at regular intervals.⁸

Objectives

1. To assess the patterns of socio-demographic variables among patients admitted with acute poisoning in a rural tertiary care hospital of Nalgonda district
2. To determine the various poison related factors in relation to the outcome of patients admitted with acute poisoning in a rural tertiary care hospital of Nalgonda district

Materials and Method

A retrospective record based study was conducted using data from patient's records such as patient's discharge summaries comprising of the patients admitted with acute poisoning to the emergency medicine

department in Kamineni Institute of Medical Sciences, Narketpally of Nalgonda district in Telangana state for a period of 7 months, i.e., from July 2019 to January 2020. So a total sample of 77 patients were included in the study. The study comprised of patients who were admitted for acute exposure to drugs and chemicals. The data includes demographic details such as age and sex, the type of poison consumed, the route of exposure, the method of exposure, time interval between exposure of poison and admission to hospital, factors effecting morbidity like duration of hospital stay, the need of ventilator support and the outcome of the patient. A study approval was obtained from Institutional Ethical Committee before the initiation of study. Data was entered and analyzed using Microsoft Excel 2010. Results were expressed in terms of frequency and percentages. Necessary statistical tests like simple proportions and Chi-square test were applied and $p < 0.05$ was considered as statistically significant.

RESULTS:

During the study period, 77 cases were admitted to the emergency medicine department with the diagnosis of acute poisoning of which, 5 cases faced mortality (6.5%) which was depicted in Figure 1.

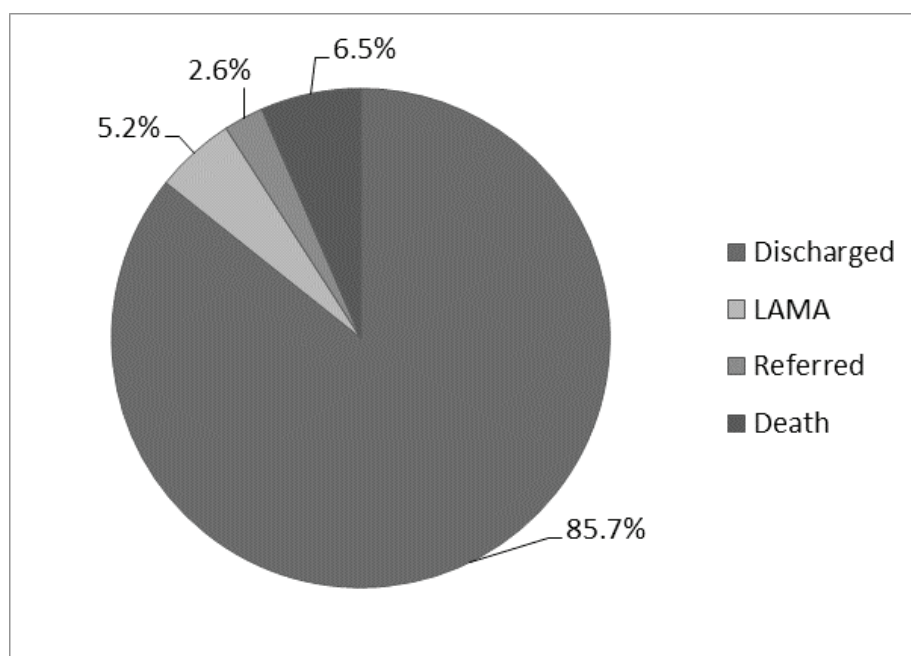


Figure 1: Outcome of the admitted acute poisoning patients

There is a higher frequency of males brought with exposure to poisoning (58.4%), compared to females (41.6%). The mortality rate in males was found to be 11.1% while there was no mortality in females. Majority of the cases were seen in the age group of 14 to 30 years (62.3%) i.e., 48 out of 77 cases. Of the 77 admitted cases of poisoning, 69 (89.6%) of them were brought with ingestion of poison, while only 8 (10.4%) were brought with inhalation of poison which was shown in Table 1.

Table 1: Pattern of various factors and their mortality rate among study subjects

Category	Total number (%)	Number of deaths	Mortality rate (%)
Total	77 (100)	5	6.5
Sex			
Male	45 (58.4)	5	11.1
female	32 (41.6)	0	0.0
Age group (in years)			
14-30	48 (62.3)	1	2.1
31-50	19 (24.7)	3	15.8
51-70	9 (11.7)	1	11.1
>70	1 (1.3)	0	0.0
Type of poisoning			
Herbicide	8 (10.4)	3	37.5
Insecticide	31 (40.3)	2	6.5
Tablet Overdose	11 (14.3)	0	0.0
Unknown Poisoning	7 (9.1)	0	0.0
Others	20 (25.9)	0	0.0
Route of Exposure			
Ingestion	69 (89.6)	5	7.2
Inhalation	8 (10.4)	0	0.0
Method of Exposure			
Accidental	10 (13)	0	0.0
Suicidal	67 (87)	5	7.5
Duration of Hospital Stay			
< 5 Days	58 (75.3)	1	1.7
5-15 Days	17 (22.1)	3	17.6
15-30 Days	2 (2.6)	1	50.0
Ventilator Support			
Yes	12 (15.6)	5	41.7
No	65 (84.4)	0	0.0
Time between exposure and admission			
<30 minutes	3 (3.9)	0	0.0
30-60 minutes	9 (11.7)	0	0.0
1-2 hours	15 (19.5)	1	6.7
>2 hours	50 (64.9)	4	8.0

Most patients (75.3%) had a duration of stay in the hospital for less than 5 days, which had a mortality rate of 1.7%, while those who had a stay of 5 to 15 days had a mortality rate of 17.6%. Only 2 patients had a hospital stay of

15 to 30 days, of which there was one mortality, giving the mortality rate of 50%. It was observed that, of the 5 cases of mortality, 4 of them were brought to the hospital with time interval of more than 2 hours. The mortality rate for those brought to the hospital with an interval of more than 2 hours is 8%. Those brought in less than 1 hour had zero mortality. Of the admitted patients, 12 patients were kept on ventilator support of which 5 died, with a mortality rate of 41.7%. 67 patients consumed poison with the intention of suicide, with a mortality rate of 7.5% which was shown in Table 1.

The Chi-square test for sex distribution has a value of 3.80, with a p value of 0.05, this result was statistically significant. The Chi-square test for ventilator support is 28.96, with a p value of <0.0001, this result was highly significant. The Chi-square value for duration of hospital stay was 11.89, with a p value of 0.002, which is significant. The Chi-square value for mortality among various poisoning was 15.30, with a p value of 0.004, significant. The p values for age group, method of exposure, and time interval between consumption of poison and admission to hospital are all statistically not-significant ($p > 0.05$).

Discussion

In the present study, majority of the cases were males and belonging to the age group of 14 to 30 years. Acute poisoning was most seen in males (58.4%) which was similar with other studies like Awasthi PM et al.⁹ (63.1%); Gupta P et al.⁸ (57.58%); Somasundaram K.V et al.¹⁰ (64.7%); Joshi M et al.⁵ (54.4%); Chakrabarty P et al.¹¹ (64.2%); Ahmad M et al.¹² (58%); Gupta BD et al.¹³ (62.1%); and Dash SK et al.¹⁴ (53%). This may be due to the family burden, society pressures and work tension. However in a study done by Jamil H⁶, there was a greater percentage of females i.e., 52.8% which is 1003 cases out of 1900. In this study, poisoning was common among younger age group 14 to 30 years, which is the productive age group leading to burden on society i.e 62.3%. This was in similar to the study done by Jamal H⁶ in which 77% of their patients fall under the age group of 11 to 30 years.

The present study showed that the maximum number of cases were of poisoning cases with insecticide consumption (40.3%) which is expected in an agriculture based setting. This correlates with other studies like

Gupta P et al.⁸ showing 57.2% of poisonings to be organophosphorous poisoning; Joshi M et al.⁵ showing 25.8%, which was the leading cause of poisoning in their study. This was against a study done by Patil A et al.¹⁵ in which majority were of consumption of household products (44.6%) followed by pesticides (14.9%). In our study 87% of patients consumed poison with an intention of suicide, which was similar to the study done by Jamal H⁶ (70%). These results may be due to the easy availability of the insecticides in rural areas for agricultural use. An increased time interval between exposure to poisoning and admission to the hospital shows increased mortality rate in our study which was similar to a study done by Somasundaram K.V et al.¹⁰ Mortality rate observed in the present study was 6.5%. This mortality was lesser when compared to other studies like Somasundaram K.V et al.¹⁰ (12.1%) and Joshi M et al.⁵ (15.8%). Efforts should be made to educate the population regarding the importance of early admission and how that will decrease the mortality. Other reasons for delayed admission could be the lack of health care centres nearby or lack of proper transportation to health care centres.

Conclusion

The present study provided pattern of various acute poisoning cases and their outcome in a rural tertiary care hospital of Nalgonda district from July 2019 to January 2020. Our results showed that insecticide poisoning is the most common form of poisoning with high mortality among males. Poisoning was common among younger age groups and the poisoning with the intention of suicide was much greater than poisoning by accident. Factors like sex, type of poisoning, duration of hospital stay and ventilator support were significant factors determining the outcome. There is a need for appropriate training and counselling sessions of preventive strategies for individuals who are at risk of acute poisoning especially the younger age groups.

Ethical Clearance: taken from Institutional ethical Committee

Source of Support: None

Conflicts of Interest: None

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Cognitive Behaviour Therapy for ‘Internet Gaming Disorder’ A Systematic Review

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Abstract

Internet gaming disorder (IGD) is a new disorder added in the 11th Revision of the International Classification of Diseases (ICD-11) by WHO. The DSM-5 states that Internet Gaming Disorder is most common among adolescents. Over the last epoch, there has been an increase in, problematic use of online videogames. Consequently, providing effective treatment is also disapprovingly crucial. The aim of this review is to assess the efficacy of Cognitive behaviour interventions for Internet gaming disorders. A computer database search PubMed, ScienceDirect, Springer Link, SciELO, Researchgate, SciHub and Google Scholar were conducted to identify all available research evidence on interventions for Internet gaming disorders. All searches have been limited to full text papers published from 2009 to 2019. The findings show that different interventions are applicable in reducing Internet gaming disorder signs and the period paid for gaming. When analysed the findings of previous studies, Cognitive Behaviour Therapy was found to be more prevalent for effective dealing of internet gaming disorders.

Key Words: *Internet gaming disorders, Cognitive Behaviour Therapy, Systematic Review*

Introduction

Currently, the whole World is discussing about the game and gaming. The entertainment business market is more concentrating on games and promoting the dependency toward gaming. Introducing new sequence of games with the release of new movies and television serials are examples for such addiction motivations. Internet Gaming Compulsion is more on gamers who have an unhealthy preoccupation with online video games, regardless of whether they are played on computers, consoles, or mobile devices³.

Internet Gaming Disorder is a “Condition for Further Study” in the DSM-5. The DSM-5 states that Internet Gaming Disorder is most common in male adolescents 12 to 20 years of age². ICD-11 categorized it under disorders due to addictive behaviours as Gaming disorder, predominantly online. Internet gaming disorder may lead to school failure, job loss, or marriage failure. Other diagnoses that may be associated with Internet gaming disorder include major depressive disorder, attention deficit hyper activity disorder, and obsessive-compulsive disorder⁸.

The prevalence of Internet gaming disorder is unclear because of the varying questionnaires, criteria and thresholds employed, but it seems to be highest in Asian countries and in male adolescents 12-20 years of age. There is an abundance of reports from Asian countries, especially China and South Korea, but fewer from Europe and North America, from which prevalence estimates are highly variable.^{14, 10}

So, in such a life-threatening condition, it is vital to review available, pertinent literature effective for gaming disorders. These findings can lead to the directions toward appropriate interventions for Internet gaming disorders.

Method

An organized systematic review has been conducted in computer database by the search terms: Psychological/ Treatment/ Intervention for Internet gaming disorders/ internet gaming addiction. The search databases were PubMed, ScienceDirect, Springer Link, SciELO, Researchgate, Sci Hub and Google Scholar and selected full text papers published from 2009 to 2019.

The following results were contained within in each database: ScienceDirect-7, PubMed-5, Springer Link-2, Sci Hub-2, SciELO-3, Research gate-3 and Google Scholar-8. There were a total of 30 studies discussing about the treatments for internet gaming disorders but screening of the studies in PRISMA criteria excluded 20 numbers of studies and selected only 10 studies for the meta-analysis. The initial exclusion was based on the duplication of studies and 7 studies excluded based on the duplication criteria. Then, the number of studies identified was 23 and again screened for full papers, five of the studies omitted. There were total 18 numbers of studies with full papers. Then, according to the eligibility criteria, 8 additional studies were eliminated since they reported lack of treatments, 4 studies were deleted since not mentioned about effectiveness of the treatments, 3 other studies rejected as not mentioned name of the interventions, 3 other study also excluded because of inclusion of psychiatric medication along with psychological treatments. Consequently, there were only 10 studies to proceed with the systematic analysis.

Results

Thirty studies were evaluated in terms of sample characteristics, aim of the study, treatment, and results. Although the searched for studies from 2009, in the current systematic-analysis, the first study obtained from year 2012. Two studies in 2014, one studies each in 2015 and 2016. Two studies published in 2017, 2 studies in 2018 and one study in 2019.

There were a total of 30 studies discussing about the treatments for internet gaming disorders, but screening of the studies excluded 20 numbers of studies and selected only 10 studies for the systematic analysis. The initial exclusion was based on the duplication of studies and 7 studies excluded based on the duplication criteria. Then, the number of studies identified was 23 and again screened for full papers, five of the studies omitted. There were total 18 numbers of studies with full papers. Then, according to the eligibility criteria, 8 additional studies were eliminated since they reported lack of treatments, 4 studies were deleted since not mentioned about effectiveness of the treatments, 3 other studies rejected as not mentioned name of the interventions, 3 other study also excluded because of inclusion of psychiatric medication along with psychological treatments.

Consequently, there were only 10 studies to proceed with the systematic analysis and for the discussion of the psychological interventions.

Discussions

When analysing the treatment methods in all these 10 studies, Cognitive Behaviour therapy was found to be more popular for treatment of internet gaming disorders.

King et al.⁹ conducted a study on 'Clinical Interventions for Technology-Based Problems: Excessive Internet and Video Game Use'. The study presented an overview of the prevalence of technology-based problems and the known cognitive behavioural dimensions of problematic technology use. The paper also gone through issues related to the assessment of technology-based problems, and critically reviewed clinical treatments for technology-based problems and find out that multimodal approach to treatment, including psychoeducation and CBT-based therapies are more effective in management of Internet Gaming Disorders. The paper came to these conclusions through analysing of recent prevalence studies conducted in Western and Eastern countries. All the studies were with more than 1,000 participants and being published in the recent 5 years.

Karapetsas et al.⁷ illustrated the underlying factors for game addiction are poor interpersonal relationships, aggressiveness, isolation, introversion, low self-esteem, low self- control, tediousness, and communication problems. The researchers recommended motivational interviewing and social skill training as interventions for internet gaming addiction.

Internet and video game addictions: a cognitive behavioural approach was explored by Lemos et al.¹¹. The study described cognitive behaviour therapy as the best psychotherapy for Internet and video game addiction. Diagnosis and Management of Video Game Addiction was a study by Griffiths⁵. The study suggested that, family therapy, couple therapy, social skill training, mental health counselling, interpersonal therapy, motivational interviewing, subliminal therapy and behaviour therapy are effective treatments for gaming disorder.

Zhang et al.¹⁶ recognized that craving behavioural intervention is effective in reducing craving and severity in Internet gaming disorder. Young et al.¹⁵ investigated the available theoretical foundations and practical evidences and the application of the Interaction of Person-Affect-Cognition-Execution (I-PACE) model, for the development of new intervention patterns based on Cognitive-Behavioural Therapy for Internet gaming disorder and concluded that the cognitive restructuring is useful for changing the expectancies of gamers and to manage addiction towards gaming.

Torres-Rodríguez et al.¹³ conducted a study on the treatment of internet gaming disorder: a brief overview of the PIPATIC program. The model put together different aspects of interventions which include: psychoeducation, common management techniques, intrapersonal, interpersonal, family intervention, and development of

a new lifestyle. The efficacy of the treatment program reported hopeful, based on the participant observation.

González-Bueso, et.al.⁴ evaluated the effectiveness of a cognitive behavioural treatment on reducing symptomatology, and the results indicated the effectiveness of psychoeducation programme.

Nazlıgül et al.¹² carried out a study on internet gaming disorder and its treatment approaches to determine the results of psychoeducation for the parents and cognitive behaviour therapy for gamers. The analysis concluded that psychoeducation and cognitive behaviour therapy are effective interventions.

Costa et al.¹ conducted a systematic review is to create an idea of the interventions used for gaming disorders in clinical practice and taken together, verified that clinical studies primarily use CBT interventions.

Table 1: Psychological Interventions for Internet Gaming Disorders

INTERVENTION	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Psychoeducation	*						*	*	*	
Cognitive Behaviour therapy	*		*			*		*		*
Craving behavioural intervention					*					
Family therapy				*			*	*		
Couple therapy				*						
Social skill training		*		*						
Counselling				*						
Motivational interviewing		*		*						
Subliminal therapy				*						
Behaviour therapy				*						

S= study

Cognitive behavioural therapy suggested by 5 studies, Psychoeducation recommended by 4 studies, family therapy proposed by 3 studies, motivational interviewing recommended by 2 studies, social skill training proposed by 2 studies, craving behavioural intervention, couple therapy, counselling, subliminal therapy and behaviour therapy were recommended by one studies each.

Thus, the evidences from the studies suggested that, cognitive behaviour therapy, the psycho-social intervention that aims to improve mental health is found to be more effective treatments for internet gaming disorder.

Although there are a very a smaller number of studies were conducted in this field and still scientific world is not much involved in the problems related to Internet gaming disorders, a small evidence base suggests that cognitive behaviour therapy has good preliminary support in treating gaming addicted adolescents.

Conclusion

The internet gaming disorder apparently generating disturbances in individual's psychological and social wellbeing. When analysing the previous studies in internet gaming disorder intervention, both individual and family therapies were found to be essential for removal of the addiction and management of associated behaviours.

In the present review, Cognitive behaviour therapy was recommended by most of the researches and shown more efficacy to attain self-discipline and self- control.

Source of Funding: Kerala State Council for Science, Technology & Environment

Conflict of Interest: Nil

Ethical Clearance: Taken from Department Ethical Committee, School of Behavioural Sciences.

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Effects of Stretch Pole Exercises on Pulmonary Functions among Smartphone Users

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Abstract

Aim: To determine the effects of stretch pole exercises on pulmonary functions among smartphone users.

Objective: To evaluate the effects of stretch pole exercises on FEV₁, FVC, and FEV1/FVC.

Method: A total of 10 patients were selected based on the inclusion and exclusion criteria. Detailed procedure was explained to the patient in colloquial terms, and informed consent was obtained. They were allocated in a single group and were treated with stretch pole exercises. After four weeks forced vital capacity, forced expiratory volume in one second and the ratio of forced expiratory volume in one second to forced vital capacity was measured as a post test.

Result: Based on the obtained statistics, there was significant improvement in FVC, FEV1 and FEV1/FVC ratio at the end of four weeks within the group when compared to the pre-test values (p<0.05).

Conclusion: The study concluded that the stretch pole exercises both clinically and statistically have significant effect in improving forced vital capacity, forced expiratory volume in one second and their ratio among smartphone users. Therefore, the implementation of these exercises is recommended in clinical practice.

Keywords: Smart phone users, Pulmonary functions, stretch pole exercise.

Introduction

In today's society, a smartphone is one of life's essential goods and its usage has been increased progressively. The magnitude of smartphone addiction among Indian teens is from 39% to 44%, in UK it was found to be 60%, in South Korea it is 18%, double the addiction rate of 9.1% for adults [1]. "Smartphone's addiction/abuse/misuse" is now challenging the health policy makers globally to think on this rapidly emerging issue. In 2013, there were around "51 million"

Smartphone users in Urban India and rate of rise from year 2012 was 90%. The age group of 16-18 years using Smartphone's have shown a rapid rise from 5% in 2012-25% in early 2014. Prolonged smart phone usage causes faulty posture such as forward neck posture, slouched posture, or rounded shoulders which can cause injury to the structure of the cervical and lumbar spine, as well as ligaments [2].

The head represents 6% of total body weight; therefore it can significantly affect the biomechanics of human posture control, movements and activities. When set out of vertical body axis, head position interferes with the work of the other links in the kinematic chain. Changing the position of the head causes disturbances in the three-dimensional shape of the chest and its respiratory movements [3]. When forward head posture (FHP) is maintained for prolonged periods the neck

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flexors and the erector spinae muscles in the upper thoracic region are weakened due to their lengthening, and the scapula is elevated due to tension in the levator scapula, sternocleidomastoid, splenius muscles, and the suboccipitalis, which also causes tension in the upper trapezius. Therefore, because of an imbalance in the muscles, such as the shortening or lengthening, or straining or loosening of the muscles around the neck, a rounded shoulder posture is exhibited. This causes imbalance in stretching and shortening of antagonist and agonist muscles which further aggravates pain and damage [4]. Some studies have reported that the forward head posture causes nasal breathing or mouth breathing which is a mechanically incorrect form of respiration.

Body position can influence respiratory function by altering the Diaphragm, thereby influencing its ability to generate tension. Several studies have reported that a slumped, poor posture significantly reduces lung capacity, expiratory flow, and lumbar lordosis compared with a normal upright posture [5]. The shortening of respiratory muscles such as the serratus anterior, pectoralis minor and intercostalis may increase energy expenditure and reduce lung volumes and capacities [6]. The non-neutral position of neck may affect lung functions; a distinct decrease was seen in lung volumes and capacities [7]. When used for many years with postural and respiratory compromise it can further lead to decrease in functional capacity of the individual [8].

The placing of the head and neck in proper alignment can reduce airway obstruction, helping to increase pulmonary function [9]. The cervical curve interacts with thoracic vertebrae and lumbar vertebrae [10]. Increased kyphosis of lumbar vertebrae correlates with forward head posture; flexion of lumbar vertebrae leads to increased cervical extension [11].

The exercises like chin tuck ins, push ups and cervical sustained natural apophyseal glide are proven to be effective in improving respiratory functions like forced vital capacity, forced expiratory volume in one second and ratio of forced expiratory volume in one second to forced vital capacity in altered posture.

Thoracic Conditioning training on stretch pole involves exercises that are given for trunk muscles, postural control and respiratory muscles may thus have the potential to induce benefits in muscle strength, spinal

mobility and balance performance [12]. The respiratory muscles are directly involved during common core stability exercises [13]. Hence, this study is proposed to determine the effects of thoracic conditioning with stretch pole on pulmonary function among smart phone users.

Materials and Method

A Quasi Experimental Study was conducted at Saveetha College of Physiotherapy, Thandalam, Chennai. Following the Institutional Scientific Review Board and ethical committee approval the study was initiated. The study procedure was explained to all the participants with an information sheet and written informed consent was obtained.

The inclusion criteria of the study was both male and female, age 17-20 years, Smartphone Addiction Scale of Shorter Version (SAS-SV) score more than 33 in males and more than 31 in females, FVC<80%, Pectoralis minor tightness, BMI ranging from 22-25kg/m² and the exclusion criteria was Cardio Vascular diseases, Obstructive and restrictive lung diseases, Relevant Orthopaedic conditions, Trauma to chest wall and spine, thoracic and abdominal surgery.

A Smartphone Addiction Scale of Shorter Version (SAS-SV) was given to 50 subjects randomly in a population and the participants were asked to answer those questions. Based on the scores, 26 participants were recruited for next level of screening. The assessment of the individuals was done. Four subjects were excluded as they met the exclusion criteria. Also, the pectoralis minor muscle length was measured using inch tape by measuring the distance between coracoid process and 4th rib of the same side. 14 subjects exhibited muscle tightness. These participants with pectoralis minor tightness were tested for pulmonary function parameters like forced vital capacity, forced expiratory volume in one second and the ratio of forced expiratory volume in one second to forced vital capacity using spirometer. Among which 10 subjects had FVC<80% and were included in the study. They were allocated in a single group and were treated with stretch pole exercises. After four weeks forced vital capacity, forced expiratory volume in one second and the ratio of forced expiratory volume in one second to forced vital capacity was measured as a post test.

Treatment procedure:**Shoulder abduction and adduction:**

Position: The subjects were asked to lay supine on stretch pole vertically placed with knees maintained in flexed position. Subjects were instructed to repeatedly abduct and adduct both shoulders with both forearms sliding on the floor.

Latissimus foam rolling:

Position: The subjects were asked to lie on side with the stretch pole under one armpit. Subjects were instructed to rotate chest slightly open so the pole is hitting the side of the back. Extend that bottom arm up overhead. Then rotate chest toward the ground and then up toward the ceiling.

Thoracic extension:

Position: The subjects were asked to lie supine on stretch pole horizontally placed at mid back region. Knee is maintained in flexed position and the hands crossed over the chest. The subjects were instructed extend

back over the stretch pole and simultaneously take arms overhead.

Floor polishing:

Position: The subjects were asked to lie supine on stretch pole vertically placed with knees maintained in flexed position. Subjects were instructed to round hands to draw circles on the floor.

Parameters:

12 repetitions each exercise per session for 3 sets

1 session per day for 20-30mins

5 days / week for 4 weeks

Results

The collected data was tabulated and analysed using descriptive & inferential statistics. To all parameters mean and standard deviation (SD) was used. Paired t-test was used to analyse significant changes between pre-test and post-test measurements.

Table-1: Comparison of Pre-test and Post-test values of FVC, FEV₁ and FEV₁/FVC

Pulmonary function	Pre-test		post-test		SEM
	mean (in%)	SD	mean (in%)	SD	
FVC	73.7	3.45	77.1	2.5	0.562
FEV1	72.1	4.08	74.7	11.4	0.221
FEV1/FVC	99.5	6.67	102.7	16.7	0.727

Discussion

In this study, we investigated whether thoracic core conditioning exercises on stretch pole could change the respiratory function among smart phone users. Recently, the number of smart phone users has been increasing worldwide. Accordingly, the negative aspects of smart phone overuse have been emerging as a major topic of interest in young adults.

Previous studies have investigated that the people who used smart phones for prolonged duration had

partly impaired respiratory function. Legrand et al concluded that forward head posture causes shortening and weakening of the accessory respiratory muscles, thereby decreasing the respiratory function. Shortening of accessory respiratory muscles such as the pectoralis minor, serratus anterior and intercostalis may increase energy expenditure and reduce respiratory capacities^[14].

Baghery H et al reported that respiratory function in slumped sitting is significantly lower than in other posture such as normal sitting or standing & similarly,

kyphotic posture caused by using a smart phone for a long time can impair respiratory function^[15]. Measuring Pectoralis minor muscle length with an electromagnetic motion capture system using the coracoid process and the fourth rib as origin-insertion landmarks has shown excellent validity and is considered the “gold standard” method. However, the electromagnetic system is time-consuming, expensive, not typically available to clinicians, and mainly used for research purposes. A tape measure and calliper both demonstrated good reliability with the electromagnetic system. Although both tools have good reliability, a tape measure is more readily available and easily manipulated in clinical practice. Pulmonary function tests are valuable investigations in the management of patients with suspected or previously diagnosed respiratory disease. They aid diagnosis, help monitor response to treatment and can guide decisions regarding further treatment and intervention. A sitting position is typically used at the time of pulmonary function testing to prevent the risk of falling and injury in the event of a syncopal episode.

Previous studies found that subjects with head, neck, and shoulder discomfort are more likely to have a smaller cervical angle. Costa R et al stated that postural changes influences the diameter of rib cage and in long run affects the expansion of it and thereby reducing the FVC and FEV₁ equally^[16]. Gibson GJ et al concluded that overweight and obese individuals are more likely to have respiratory symptoms than individuals with a normal BMI, even in the absence of demonstrable lung disease^[17].

In this study the obese patients were excluded as obesity increases the work of breathing because of the reductions in both chest wall compliance and respiratory muscle strength. This reduction creates an imbalance between the demand on the respiratory muscles and their capacity to generate tension, which leads to the perception of increased breathing effort. Berolo S et al found the prevalence of musculoskeletal symptoms among mobile hand-held device users and their relationship to device use. They reported that prolonged smart phone usage causes faulty posture such as forward head posture, slouched posture or rounded posture^[18].

There are a number of studies about the adverse effects of smart phone overuse. However, there are

no studies about the effect of exercises in solving the abnormalities mainly respiration and its effect on pulmonary capacity among prolonged smart phone users. Hence, for these reasons we have proposed this study to investigate the effects of thoracic core conditioning exercises with stretch pole on pulmonary function among smart phone users.

This study included both male and female participants between 17-20 years of age. These exercises are subjected to be more comfortable in supine on the stretch pole which reduces strain and gives a better feeling of relaxation of the whole body. The stretch poles used were selected according to the built and comfort of the subjects. It is found from the analysis that the subjects who received four weeks of thoracic core conditioning exercises with stretch pole have shown significant improvement on the FVC, FEV₁, FEV₁/FVC ratio.

Although the exercises were short and simple, the facilitated muscles would influence the improvement of respiratory function. The core conditioning exercises help to stretch the respiratory muscles which reduce the muscle tension resulting in relaxation of the muscles of the respiration. While performing these exercises thorax is observed to stretch on the pole. The findings of the study showed that proper exercise could be a good method of improving the pulmonary function in smart phone users. Hence, we reject the null hypothesis.

Conclusion

Since the prolonged usage of smartphones adversely affects the human health, it is the need of the hour to teach young adults to be structured; to become the master of technology instead of its slave. It is concluded that the stretch pole exercises both clinically and statistically have significant effect in improving forced vital capacity, forced expiratory volume in one second and their ratio among smartphone users. Therefore, the implementation of these exercises is recommended in clinical practice.

Ethical Clearance: Obtained

Source of Funding: Self

Conflict of Interest: Nil

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A Study on Employee Health and Safety of Weaving Cooperative Society with Reference to Kannur District

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Abstract

The study on employee health and safety in weaving cooperative society examines the health and safety adopted by the management for the employees and also the level of satisfaction of the employees. Through this study it gives an overall idea about the health and safety measures taken in the weaving cooperative society and also it can improve the strategy if needed. And it's also a kind of information which can be adopted by many. The study is mainly targeted at the employees in the weaving cooperative society and the study is conducted in cooperative weaving society in Kannur district. The type of research used in the study is descriptive in nature.

Keywords: *Employee health and safety, weaving cooperative society, Kannur district, Kerala handloom industry, employee awareness, role of management in employee health and safety, measures taken by society, training of employees.*

Introduction

In the economy of Kerala handloom occupies a prominent place as a traditional industry. Handloom industry is the major traditional industry in Kerala. The handloom industry includes the cooperative societies both industrial, primary, kadhi units and the unorganized individual units. Handloom industry has its presences in all the 14 districts of Kerala. The directorate of handlooms, government of Kerala has identified Kasargod, Kannur, Palakkad, Kuthampully in Thrissur district, Chandamangalam in Ernakulam district, Balaramapuram in Thiruvananthapuram district as places of regional importance in handloom production. Handloom industry in Kerala is dominated by the cooperative society. Among these Kannur is one of the handloom cooperative societies.

Kannur the Northern district of Kerala⁵, is properly known as the 'city of loom and lore's', town of export excellence". Due to its unending relation with handloom industry. Industry is spread in 37 panchayat and 5 municipalities'. Because of the quality and frame of kannur handlooms, kannur is commonly known as the Manchester of Kerala. The total number of handlooms

societies in Kannur are nearly 52 and among them working are only 37 and rest are 5 are liquidated and 10 are not working. The first weaving society introduced in kannur was at chirakkal, in 1936.

⁵In the present study titled 'employee health and safety in weaving cooperative society of Kannur district' the researcher mainly focuses on the importance of health and safety of employees of cooperative society, the study also analyze the health and safety measures provided by the society for the employees. Since health is an important part in the life of human being the organization gives keen interest in the same. In weaving society there are many measures that are taken by the management in the health and safety of the employees. The training and other procedures are done in order to make the employee familiar about the safety measures and regular medical checkups are also conducted for the employees. So this study helps to know about the procedures taken by the weaving society for the health and safety betterment of the employees.

Statement of the Problem:

Human resource of an organization is considered to be the wealthier assets. But the organization in order to

satisfy the consumers need provide more focus on quality and quantity of products produced. Management gives more focus on the customer satisfaction by ignoring the employee health and safety that effect in future on their work. And this leads to their poor performance and low quality of products. It is important that management has to give attention on both employee health and safety and on production. So, management can take appropriate strategy to improve the employee health and safety to have a better future.

Literature Review

1. K. Logasakthi, K.Rajagopal,¹ in the year 2013, made a “study on employee health, safety, and welfare measures of chemical industry in the view of Salem region. And study focused on the health and safety measures taken by the management for their employees. And the study found that management provides all the facility and also all the health and safety to the employees that will help to produce high performance in there working.

2. Samuel howardquaterny and Bill buenarpiplampu,³ in 2012, made a study focused on “employee health and safety practices: An exploratory and comparative study of the shipping and manufacturing industries in Ghana”. The purpose of the study is to examine the employee health and safety practices in shipping and manufacturing industries. The study resultsthat shipping industry has more health and safety measures than the manufacturing industry. Since the shipping industry consider health and safety as a part of social responsibility.

3. Susana garicahemero, Javiergarrica and Dale ritzel,⁴ in the year 2011, made a study on “the impact of occupational hazard information on employee health and safety an analysis by professional sector in Spain”. The aim of the study was to analyses the influence in which preventives information has on certain variables relating to workers. The results indicated the importance of information in companies. The given information for workers has the most positive impact.

4. Muhtesembaran, PelinKantenmurat², in the year 2009, conducted the study on “An empirical research on the relationship between job insecurity and employee health and safety”, the study is to investigate

the relationship among the insecurity perception of employees, health symptoms and unsafe behavior of employees. The study results that both mental and physical health symptoms are related with job insecurity perception.

Objective of The Study

1. To study the employee health and safety in weaving cooperative society.
2. To study the awareness of workers about health and safety in the workplace.
3. To study the role of management in communicating the health and safety measures.
4. To know the satisfaction level of employees towards health and safety measures.
5. To study employee satisfaction with respect to working environment.

Hypothesis:

The hypothesis governing the study is given below:

1. H0: There is no association between awareness of workers and the effective communication of health and safety measures.

H1: There is an association between awareness of workers and effective communication of health and safety measures.

2. H0: There is no significant relationship between the work environment and the level of satisfaction of employees.

H1: There is a significant relationship between the work environment and the level of satisfaction of employees.

Research Methodology\

The study is purely descriptive in nature. Both primary and secondary data is used for the study.

Primary data was collected through questionnaire among 40 respondents from weaving cooperative society. Secondary data are collected through books, magazines, journals, paper publications, reports. The sampling method used for the study is simple random

sampling.

Sample design

Sample size cooperative societies	Total number of respondents
weaving cooperative society	20
weaving cooperative society	20
Total	40

For the purpose of getting analysis output the statistical tool used for the study are chi-square, ANOVA and regression.

Scope of the Study:

The study is limited towards the 2 cooperative society of Kannur district. The study is mainly focused on the health and safety of the employees in the weaving cooperative society in Kannur district. Since the study is focused to the health and safety of employees it does not have the scope for questions from whole of cooperative society and their other operations. So, the study is useful for assessing the regulations of management in employee health and safety.

Analysis And Interpretation:

For the purpose of knowing the reliability of the questions which consisted of 26 items the Cronbach

alpha was conducted, and by testing the reliability, the Cronbach's alpha value obtained is 0.966, which indicates a high level of consistency i.e., the extent to which a scale produces consistent result.

Reliability Statistics	
Cronbach's Alpha	No of Items
.966	26

In the present study titled 'a study on employee health and safety of weaving cooperative society with reference to Kannur district 'mainly focus on health and safety of the employees. Majority of the employees are with age group of 36-45 with the qualification pre-degree and with the experience of 15 years. Study helps to know about the employee awareness about health and safety and also there satisfaction level in the working environment.

For analysis the chi-square test is being used as statistical tool. A sum of revision has been directed to discover the association among awareness of workers and the effective communication of health and safety measures is yet to be obtain its owing in the exploration.

Chi- square

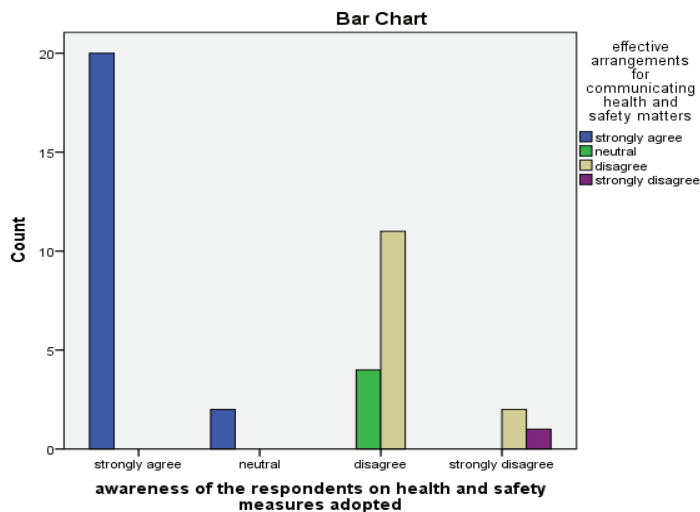
Table: 1 Awareness of the respondents on health and safety measures.

Chi square	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	52.923a	9	.000
Likelihood Ratio	60.109	9	.000
Linear-by-Linear Association	34.430	1	.000
N of Valid Cases	40		

a. 13 cells (81.3%) have expected count less than 5. The minimum expected count is .05.

Source: primary data

Table no 1.1 shows a significant impact of awareness of respondents on health and safety measures adopted and effective arrangements for communicating health and safety matters. Since p value <0.05, df=9, since reject the null hypothesis and alternative hypothesis is accepted.



The statistical tool used for the analysis is regression. A sum of revision has been directed to discover the association among awareness of workers and the effective communication of health and safety measures is yet to be obtain its owing in the exploration.

Regression Model 1

Table : 2 The safety of working environment and the satisfaction level of employees

Table 1.2: Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859a	.738	.732	.508
a. Predictors: (Constant), satisfactory level of health and safety measures taken				
b. Dependent Variable: safety of working environment				

Source: primary data

The regression analysis in table 1.2 with the fore mentioned dependent and independent variables supported an R² of 0.738 and adjusted R² value of 0.732.

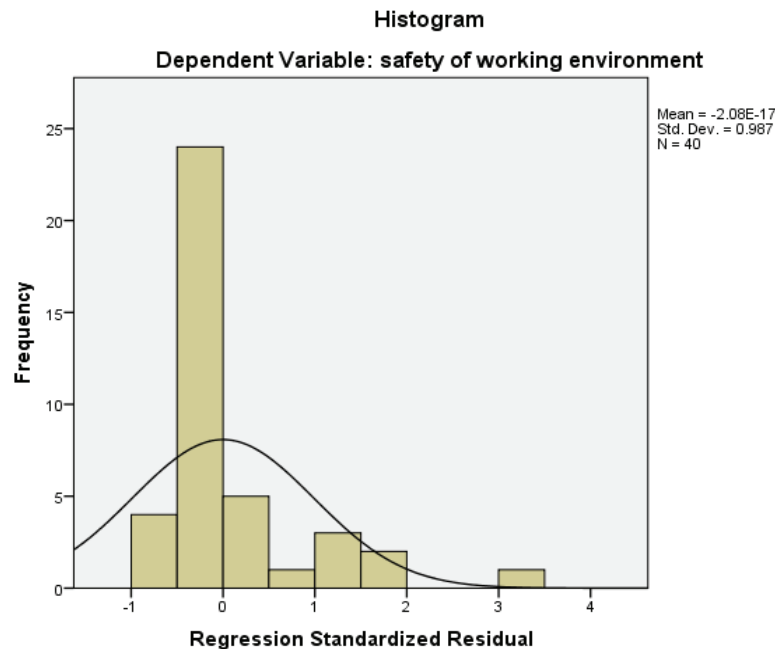
Table : 3 ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	27.690	1	27.690	107.255	.000b
	Residual	9.810	38	.258		
	Total	37.500	39			
a. Dependent Variable: safety of working environment						
b. Predictors: (Constant), satisfactory level of health and safety measures taken						

As shown in Table 1.3, the examination of the model also indicated that all these variables together work as a significant predictor of the effect of testing on employee satisfaction (F=107.255, P< 0.01).

Table : 4 Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.488	.146		3.343	.002
	Satisfactory level of health and safety measures taken	.753	.073	.859	10.356	.000

a. Dependent Variable: safety of working environment

The study postulated in hypothesis that there is significant relation between satisfactory level of health and safety measures taken. In support with this, the study significant result (beta=0.488, P<0.01) Thus, the study found support for the significance of hypothesis.



Findings

- The majority of the employees are in the age group of 36-45 in weaving cooperative society.
- Majority of the employees in weaving cooperative society are female.
- Majority of the employee in cooperative society are with the qualification pre-degree.
- Majority of the employees are provided with well developed training facilities.
- Also majority of the employees are with above 15 years of experience.
- Employees are provided with the health and safety measures and also the basic needs are being satisfied.
- The majority of the employees are registered in the trade unions.
- Employees are provided with well furnished work space.

- Safety inspections are being conducted in regular intervals to ensure the safety of the employees at work.
- Study resulted that employee are well satisfied with the health and safety measures taken by the society.

Suggestion:

- The management should provide the health insurance to the employees working in the cooperative society.
- The employees should be provided face masks free of cost so that respiratory issues may not occur to the employees.
- The employees should be given adequate training in handling the equipments so that they reduce the cost of employing other equipped people.

Conclusion

Health is quite significant for every human capital. Human capital here means the employees. By giving the proper health and safety for the employees the management can achieve higher productivity. The management communicates the health and safety measures taken to the employees, and for this purpose they should have a proper superior subordinate relationship. This study establish the significant relationship between the awareness of workers and the effective communication of health and safety measures and also the working environment and level of satisfaction of the employees and the study conclude that it has a positive relationship between the awareness

of workers and the communicating the health and safety measures and also it has a significant relation among the work environment and the level of satisfaction of employees. Hence, the study of employee health and safety in weaving cooperative society in Kannur District.

Ethical Clearance- Nil

Source of Funding- Self

Conflict of Interest- Nil

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A comparative study of Venous and Capillary blood glucose in a Tertiary Care Hospital

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Abstract

Introduction: The cornerstone of providing optimum diabetic care in a tertiary care hospital is monitoring of glycemic status of the patient by the health care provider. Bed-side monitoring helps in achieving the glycemic goals in admitted patients. But it is important that the glucometer being used is accurate, calibrated and the values obtained from glucometer are as near as to the plasma glucose values obtained in the laboratory. Above factors can lead to unnecessary change in treatment which might result in hyper or hypoglycemia, which is a life-threatening situation and most common complication of diabetes. Therefore correlation in capillary and venous blood glucose will definitely help in better management of patients, especially in Intensive Care Units (ICUs). **Aims and Objectives:** The present study was done to determine the mean difference and correlation between capillary and laboratory venous plasma glucose estimation. **Material and Methods:** The study was carried out in a tertiary care hospital in Meerut. Total 373 subjects (176 males and 197 females) including 149 cases with altered glucose levels and 224 control subjects were studied. After overnight fasting, capillary blood glucose by glucometer and venous plasma glucose by Siemens autoanalyzer were estimated from all subjects, aged above 18 years. Both samples were taken at the same time. Mean difference and correlation coefficient were determined. **Results:** It was observed that there was a significant difference between capillary and venous blood glucose values. The capillary blood glucose value on an average was 10.19% higher than venous blood glucose values. **Conclusion:** According to the results obtained, it was concluded that glucometer, as a sole measuring device in a hospital setup, is not satisfactory. The venous blood glucose is a better indicator and is of utmost importance for confirmatory results. This is also of utmost importance in deciding the dose of insulin in diabetic patients who are on insulin infusion.

Keywords : Continuous glucose monitoring, Venous blood glucose, Capillary blood glucose

Introduction

Monitoring of blood glucose concentrations is very important, especially in diabetics. The blood glucose may fluctuate from time to time. There are various factors which may lead to this fluctuation in daily healthy life including diet component, level of activities, mental status and change in environment. This fluctuation

further increases in diseased state, especially in type 2 Diabetes Mellitus (T2DM). Blood glucose monitoring is the basis of the treatment of diabetes. It helps to formulate therapeutic measures, determines the level of carbohydrate metabolism, evaluate effects and optimal control of blood glucose^[1]. Blood glucose estimation can be done by capillary blood (finger-prick method) using a glucometer at the bedside of the patient and by venous blood (plasma) sampling tested in the laboratories.

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Continuous glucose monitoring (CGM) has an immense potential in revolutionization of diabetic care. The data that is provided is both complex and voluminous^[2]. CGM device is used to measure blood glucose in the interstitial compartments. This interstitial

blood glucose level is related to blood glucose through a diffusion process^[3]. Few studies have been done to estimate the accuracy of CGM by glucometers. Rabiee *et al.* reported that CGM missed around 50% of the 30 episodes of hypoglycemia as estimated by Accu-Check glucometer, and therefore the authors concluded that it is unsafe to use glucometers especially in Intensive Care Unit (ICU) settings^[4].

Glucometers work predominantly on two principles: Electrochemical(amperometry) and reflectance photometry. The enzyme used in glucometers is glucose oxidase. This induces an electric current through the strip, which is in proportion to the amount of glucose present. In reflectance glucometers, the colour of the strip changes colour according to the amount of glucose present in the sample. The quantification of colour change in these glucometers is done by reflectance photometry. Glucometers can give a false low value if the drop of blood does not cover the entire testing area of reflectance. Also, they are either manual (wiping) or automatic (non-wiping). Another factor which has shown to affect the glucose values in reflectance meters is the ambient temperature. It has been demonstrated in one study, that the manual reflectance glucometer overestimated the glucose concentrations by 14% at 44°C and underestimated by 12.7% at 25°C^[2].

The American Diabetes Association (ADA) recommends that glucometers should produce measurements within 5% of reference values. They can be used as an alternative to reference glucose analyzers if the measurement error of these glucometers is less than 5%^[5]. The purpose of this study was to compare Venous and Capillary blood glucose in a Tertiary Care Hospital.

Material and Method

Study design and setting

This is a cross-sectional study carried out in Clinical Biochemistry Laboratory, Subharti Medical College and associated Chhatrapati Shivaji Subharti Hospital, Meerut, for a period of 6 months(August 2019 to January 2020).Chhatrapati Shivaji Subharti Hospital, Meerut. A total of 373 subjects were included in the study .Out of which 167 were males and 206 were females.

Sample Collection:After pre-informed overnight fasting (atleast 8 hrs.) venous blood samples were collected by professional nurses from the right antecubital vein in fluoride vial and capillary blood was collected by finger-prick from right ring finger were taken simultaneously from all the subjects.

Sample Processing

The capillary blood glucose was estimated by CareSens N Glucometer using strips by Glucose Oxidase Method. The venous blood samples were centrifuged for 10 minutes at 3500 rpm to obtain plasma in Clinical Biochemistry Laboratory. The blood glucose levels were estimated by a fully automated analyzer (Dimension RXL) by hexokinase method.

All subjects were divided into two groups according to the glucose values obtained in the laboratory. Control group included non-diabetic values (fasting <100 mg/dL) and Diabetic group (fasting \geq 100 mg/dL). Diabetic group included a total of 149 subjects (67males and 82 females) and the control group included 224 subjects (109 males and 115 females).

Statistical Analysis

The statistical significance was assessed by a Pearson correlation. A value <0.0001 was considered as statistically significant.

Ethics

The approval from the Institutional Ethical and Research Committee was obtained before conducting the study.

Results

A total of 373 subjects were enrolled in the study, out of which 176/373 (47.2%) were males and 197/373 (52.8%) were females with a mean age of 38.7 \pm 13.2 and 40.6 \pm 12.2 respectively. The mean venous and capillary blood glucose were 115.4 \pm 55.6 and 126.2 \pm 62.4 respectively, giving a statistically significant difference (p<0.001) between the mean values for the laboratory and capillary glucose samples (10.8 mg/dL; 95% confidence interval (CI) 5.8 to 22.8).

The authors observed a good correlation between capillary and venous plasma glucose level in all the

subjects (Fig 1) , control group (Fig 2) and Diabetic group (Fig 3) and on statistical analysis , significant p value (<0.0001) was obtained in all the groups. Appreciable differences were observed despite good correlation in capillary and venous plasma glucose level (Bland and Altman plot- Fig 4) .

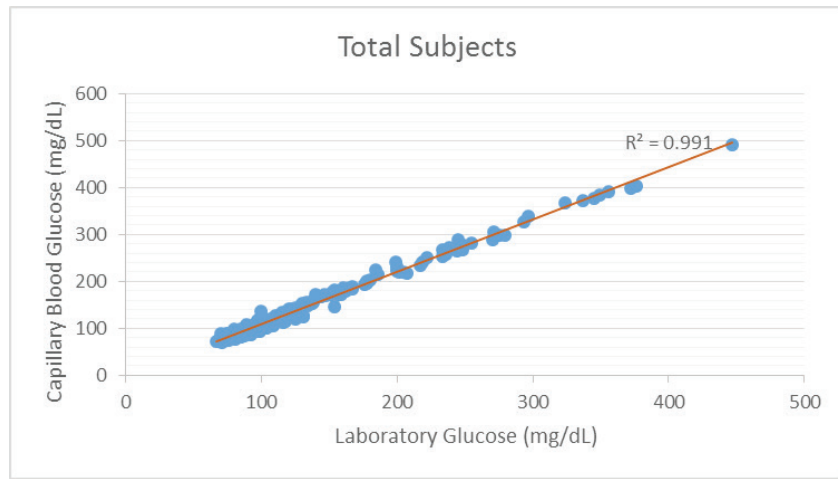


Fig 1:The correlation between venous and capillary blood glucose in all subjects . (n=373)

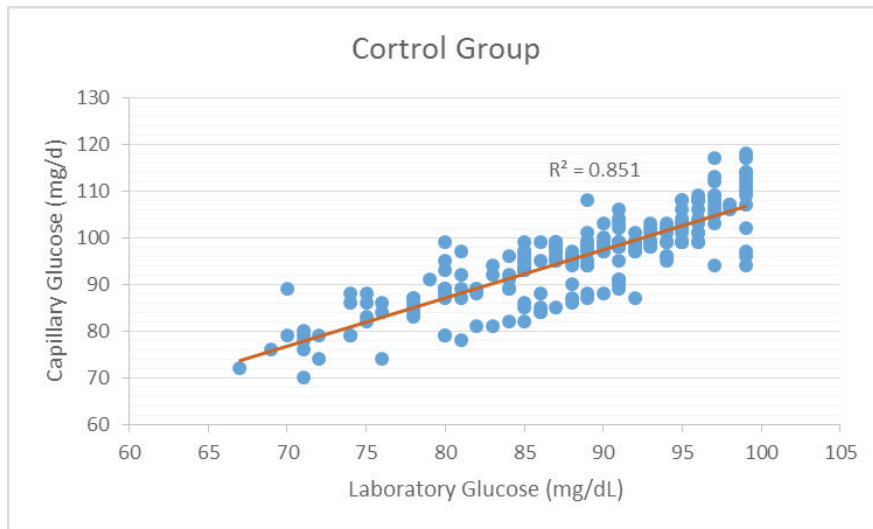


Fig 2:The correlation between venous and capillary blood glucose in control group . (n=224)

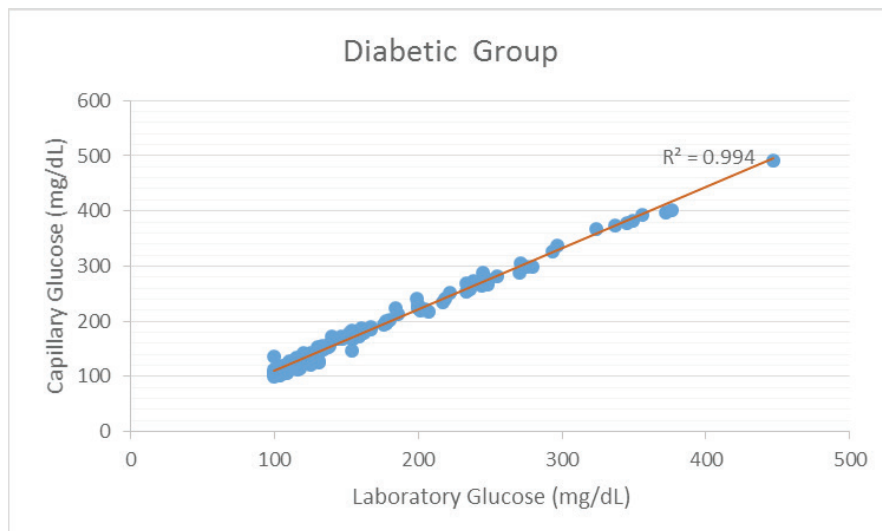


Fig 3:The correlation between venous and capillary blood glucose in Diabetic group. (n=149)

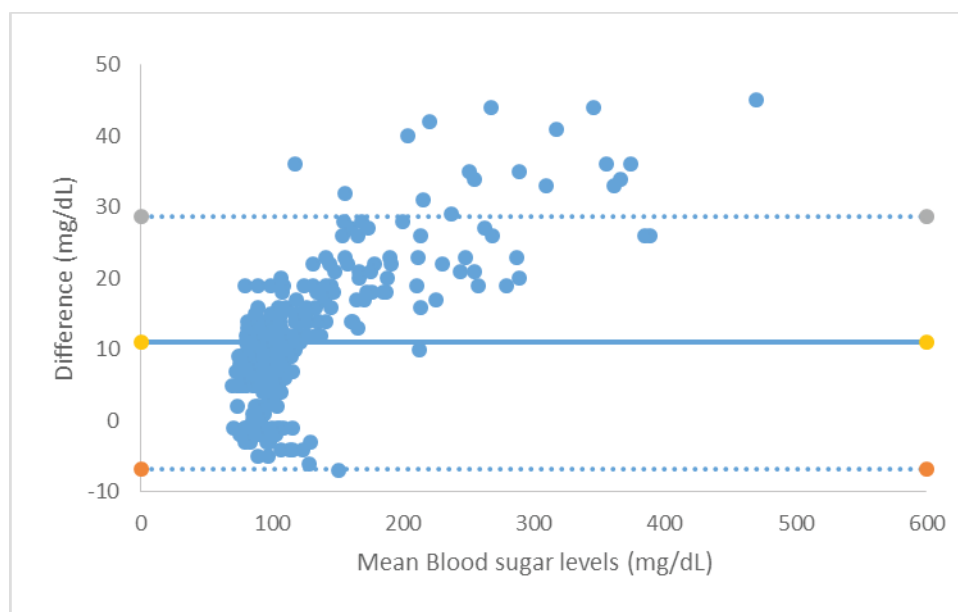


Fig 4: Bland and Altman plot: capillary and venous plasma glucose. (n=373)

Discussion

Blood glucose monitoring should be done on regular basis for preventing hypoglycemia and titrating medications [6]. However, it is important that blood glucose measurement is accurate. The evidence provided in literatures is not established as to whether capillary or venous blood glucose measurements are more accurate. In addition to this, there is an increased concern about the accuracy of capillary blood glucose estimation in systemic illness, and in such patients, it has been suggested that venous sampling tested in laboratories may be more accurate [7].

The aim of the present study was to test the accuracy of capillary derived blood glucometer results versus venous plasma glucose levels tested in the laboratory. A statistically significant difference ($p < 0.0001$) was seen between capillary versus venous blood glucose estimations. In our study, capillary values were higher than the venous values. In control group (< 100 mg/dL), the capillary values were higher by 8.5%, while in patients with high blood glucose levels (≥ 100 mg/dL), the capillary values were higher by 10.4%. The capillary blood glucose was higher by 9.4% combining both control and high glucose value groups.

Similarly, Mitra S *et al* reported that the capillary values were higher than the venous values and it was

within 10-11% of the venous values [8]. A study by Patel N *et al* compared capillary and venous blood glucose levels taken from patients on outpatient department basis irrespective of their diabetic and non-diabetic status. The values were compared at less than 100 mg/dl, between 100-200 mg/dl and more than 200 mg/dl. The capillary blood glucose levels measured by glucometer were 7% to 15% higher than venous blood glucose levels by laboratory and also agreed more than 95% times [9]. Yang C *et al* reported in their study that the mean capillary blood glucose concentration was higher than the mean venous blood glucose concentration by 35% [10]. The phenomenon of capillary blood glucose concentrations higher than venous blood glucose concentrations was common at all time points

In the present study, it was also observed that the variation between capillary and venous blood glucose values increased with an increase in the blood glucose values. Similarly Patel N *et al* also reported in their study that the variation percentage between capillary and venous values increases as blood glucose level increases [9].

Capillary blood glucose measurement can be done for glucose charting in all patients, but it should be compared with plasma glucose values on a daily basis. Boyd R *et al* reported, a degree of caution should

be taken in the interpretation of bedside glucometer measurements as they may not be accurate to replace laboratory blood glucose results.^[7]

Conclusion

To conclude, capillary blood glucose estimation by glucometer is not as reproducible as venous blood glucose estimation. The variation becomes wider as the glucose value increases without any specific trend. It is recommended that venous blood glucose should always be estimated as it is very important to test an accurate blood glucose value and find out symptoms of hypo or hyperglycemia immediately without further deterioration. So, it is advisable that where the blood glucometer result is borderline or likely to alter clinical management, a laboratory plasma glucose measurement is essential.

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Prevalence of Domestic Violence among Married Women of Urban Slum

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Abstract

Background & Objective: Violence is a global issue and domestic violence is no exception. In the world about 35% women are the victims of domestic violence. Domestic violence has its serious effects on women's overall health, which can be seen in the form of short and long-term physical, mental and reproductive health problems. In some setting, it may increase the risk of acquiring HIV. Women residing in slum are at more risk of it. Hence, this study was conducted to know the prevalence of domestic violence among married women residing in an urban slum.

Method: A cross-sectional study was carried out among married women in the year 2015 which included 385 married women, who were selected by systematic sampling method. Information on socio-demographic factors and domestic violence was collected through face-to-face interview using a pretested semi-structured questionnaire after obtaining written informed consent. Data was analyzed in SPSS software version 20. Frequency and percentage were used to calculate the prevalence of domestic violence.

Results: In our study prevalence domestic violence was 42.1%, among them verbal abuse was found to be 88.8% followed by psychological (81.5%), financial (63.6%), physical (53.7%) and sexual (14.8%).

Interpretation & Conclusions: Verbal and Psychological abuse seems to be more and sexual abuse was less among married women residing in a slum.

Key Words: Domestic violence; Married women; Prevalence; Slum area

Introduction

Domestic violence is defined as "Any incident of threatening behaviour, violence or abuse (psychological, physical, sexual, financial or emotional) between adults who are or have been intimate partners or family members, regardless of gender or sexuality"¹. Both men and women can be the victim or perpetrator, most commonly women. Physical violence has serious consequences for woman's overall health^{2,3}.

Worldwide 35% of women experience either physical and/or sexual intimate partner violence or non-partner sexual violence⁴, India accounts for 35.4%⁵. In Karnataka, 20% of women aged between 15-46 years experience physical violence and 3% experience sexual violence⁶.

Few studies have reported a higher prevalence of domestic violence in slums than in general population for example studies were done among women residing in slums of Bangalore and Nagpur showed 50% and 66% respectively². Similarly cross-sectional studies in a slum area of Kolkata and Ludhiana, Punjab revealed 54% and 61.3% prevalence respectively^{2,7}. Domestic violence is prevalent worldwide and affects the dignity and autonomy of women. So it is very important to know the prevalence and types of domestic violence. Hence the present study was undertaken in a slum area.

Materials and Method

The present study was a Cross-Sectional study conducted among married women residing in slum areas of Ramnagar which is one of the urban field practice areas of KAHER's J.N. Medical College, Belagavi,

from February to December 2015. Ramnagar consists of 4 slums with a population of 8164 and expected eligible couples about 1440 (assuming 150 per 1000 population). The sample size was calculated based on the prevalence domestic violence in a previous study², using the formula $4pq/d^2$. Sample size came to 350, systematic sampling technique was used to select the study participants. For non-response, 10% of total sample size was added to the calculated sample size making it to 385.

Permanent residents of the study area (residing in the area at least for one year) were included. Pilot study was conducted on 10% of the total sample. House to house visit was made to collect data and face to face interview of every 4th married woman after picking the first number randomly was done. Information was collected using a pretested, predesigned, semi-structured questionnaire

after obtaining their informed consent. Rapport was established with the study participants with the help of Anganwadi worker (AWW). The questionnaire was incorporated with the information pertaining to the socio-demographic characters and presence of domestic violence ever in the lifetime and its forms. Ethical clearance from Institutional Ethics Committee (IEC) of KAHER's J.N.M.C was obtained for the study. Data was analyzed using the statistical package for social sciences (SPSS) version 20. Percentages were used to calculate the overall prevalence and prevalence of different types of domestic violence.

Results

Prevalence of the domestic violence among married women was found to be 42.1%. Table 1 shows the socio-demographic characters of participants.

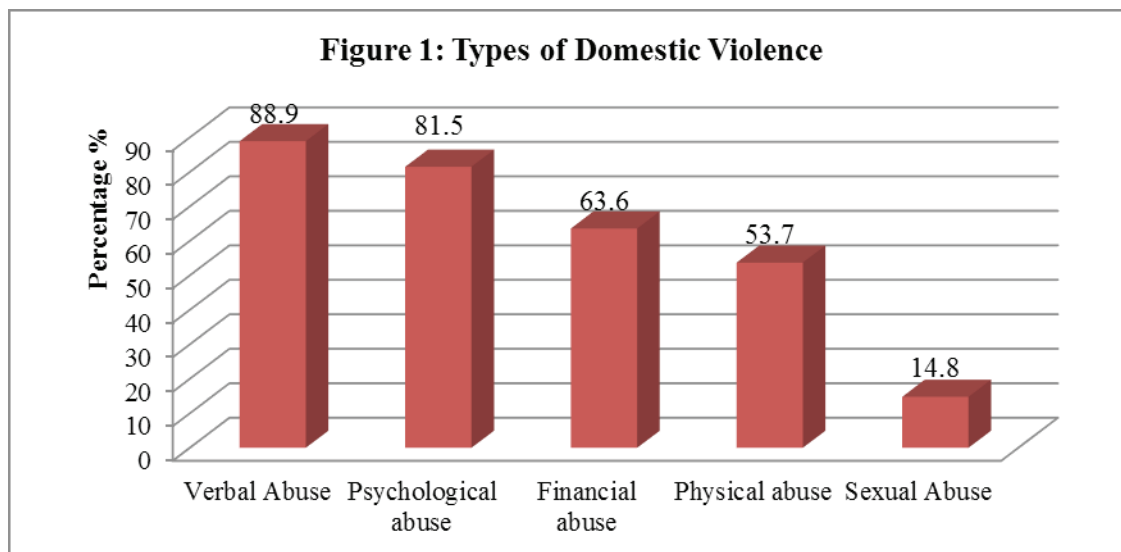
Table 1: Socio-demographic characteristics of married women

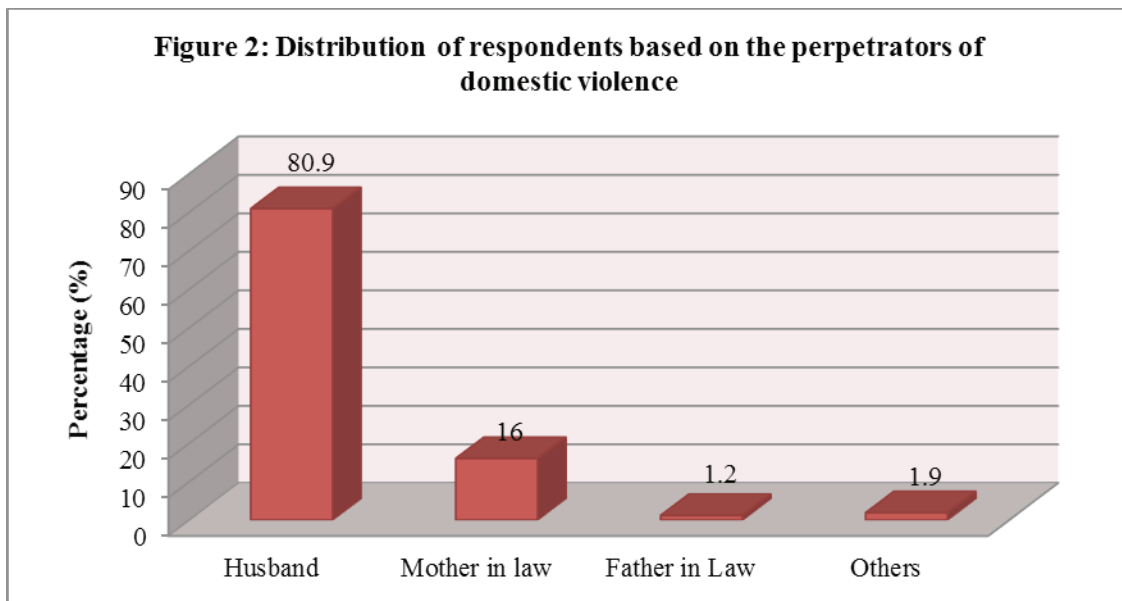
Background characteristics	No.	Percent
Age (in Years)		
<20 years	11	2.9
20-25 years	104	27.0
26-30 years	86	22.3
31-35 years	51	13.3
36-40 years	52	13.5
>40 years	81	21.0
Religion		
Hindu	229	59.9
Muslim	156	40.5
Education status of respondents		
Illiterate	96	24.9
Primary	90	23.4
Secondary	152	39.5
PUC	28	7.3
Degree and above	19	4.9
Education status of Husbands		
Illiterate	90	23.4
Primary	93	24.2
Secondary	121	31.4
PUC	46	11.9
Degree and above	35	9.1

Cont... Table 1: Socio-demographic characteristics of married women

Socioeconomic Status		
Class I	5	1.3
Class II	27	7.0
Class III	71	18.4
Class IV	220	57.2
Class V	62	16.1
Occupation of wife		
Housewife	260	67.5
Employed	125	32.5
Occupation of Husband		
Unemployed	21	5.5
Employed	364	94.5
Type of family		
Nuclear	187	48.6
Joint	198	51.4

The study shows nearly 60% of the respondents were married at the age of 18 or above. Majority (92.5%) marriages were arranged. More than half (62.1%) of the respondents family consisted of 5 or fewer members. According to property wise, 80.3% did not possess any kind of property in their names. Maximum (82.3%) of respondents had less than 4 children range was (1-4) and 66.5% of the respondents had <3 girl child (range was (1-3)). Less than half (40%) of the respondent's husbands were alcoholic.





Discussion

The prevalence of domestic violence found in this study was similar to the study conducted in an urban slum of Mumbai & in a semi-rural area of western Turkey^{8,9}. However, it was more than 50% (51.9% & 54%) in the studies conducted in slum area of Kolkata & rural Nepal respectively^{2,10}. The difference in the prevalence could be because of the perception of women in some culture considering abuse by the husband as anormal phenomenon.

In the present study as far as types of violence was concerned, maximum (88.9%) was verbal abuse followed by psychological, physical and least was sexual. A similar result was found in studies conducted in urban slums of Mumbai^{8,11}. Whereas study in rural Nepal showed that nearly half (46.2%) of the violence was sexual violence followed by physical violence¹⁰.

The majority (80.9%) of respondents were abused by their husbands, similar result with the study conducted in Eastern India¹².

In the present study, under-reporting of domestic violence by respondents would have been there due to cultural factors and feel ashamed or afraid of revealing it. Secondly, as this study was conducted in slum area the study result may not be generalized.

In conclusion, the study revealed that domestic violence was prevalent in the urban slum community.

Further studies need to be carried out to find the factors associated with it so that measures could be taken to reduce domestic violence.

Acknowledgment

Authors are grateful to the participants and Anganwadi workers for their kind co-operation towards the collection of data, Department of Public Health and Department of Community Medicine, J.N Medical College for their technical support and also to the Digital library, Dr. S. G Desai for the internet service to this study.

Conflicts of Interest: Authors declare that, there is no conflict of interest.

Ethical Clearance: Taken from Institutional Ethics Committee (IEC) of KAHER's J.N.M.C, Belgaum, Karnataka.

Source of Funding: Self

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Exploring Impact of Smart Phones Usage on Interpersonal Relationship of Students in Meerut, (UP)

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Abstract

Introduction: As Smart phones seep into public and private contexts, additional opportunities for conflict emerge. Young people use the smart mobile phone in positive ways to organize and maintain their social networks. However, there are also negative impacts on young peoples' peer relationships. **Aim and Objectives:** 1. This study was done to assess the impact of smart mobile phone usage on interpersonal relationship of medical and dental students. 2. To Increase awareness about negative effects of smart mobile phone.

Material & Method: A cross sectional study conducted in Subharti Medical College and Subharti Dental College.

Result: According to our survey, usage of mobile phone is affecting the relations and bonding between the students and their family members, as they are more connected with the virtual world through their mobile phones rather than the real world.

Key Words: Smart mobile phone, Dental students, Medical students.

Introduction

As smart phones seep into public and private contexts, additional opportunities for conflict emerge. The involvement of smart phones in interpersonal conflict can be seen when a mother tells her child to put their phone away during dinner, or when spouses become angry because their partner is on the phone instead of talking to them. The adoption of the mobile phone by young people has been a global phenomenon in recent years. It is now an integral part of adolescents' daily lives and is for the majority, the most popular form of electronic communication. In fact, the mobile phone has turned from a technological tool to a social tool [1]. Young people use the mobile phone in positive ways to organize and maintain their social networks. However, there are also negative impacts on young peoples' peer relationships. The impact of the mobile phone on young people's peer groups has been extensive. Adolescence is a time of change and increasing influence of the peer group and thus communication amongst peer group

members is central to the identity of the individual^[2]. The impact of mobile phone on peer relationships has transformed the peer group into a truly networked society^[3].

People have to decide if they want to interrupt their primary interaction, and how they want to do it. The secondary person has to decide how they are going to react to being interrupted by another party (i.e. phone call). Research demonstrates that mobile phones make people rank their interactions, and more often than not, people will answer the call, even if it is just to say "I'll call you right back". Mobiles have also helped aid the social emancipation of young people from parental authority^[4].

If teenagers have mobile phones, their parents often feel more security when children travel independently outside the home. Teenagers are also freed from having to talk from a family landline, which is often in quasi-public space (Ling and Baron, in press). For young adults

living away from home, these freedoms are magnified. Many people value their phone as their life and have it with them always. It is rare for individuals to turn off their phones. This ability to constantly connect has major implications for interpersonal relationships. Some researchers have begun to explore how use of mobiles affects people emotionally or socially. Beranuy et al.(2009) report a correlation between mobile phone use and mental distress, as seen, for example, in deterioration of family and social relationships^[5].

Aim and Objectives

1. To assess the impact of smart mobile phone usage on interpersonal relationship of medical and dental students.

2. To Increase awareness about negative effects of

smart mobile phone.

Material & Method

This present cross sectional study was carried out in Subharti Medical College and Subharti Dental College Meerut UP. Simple Random Sampling Technique was used to select 400 students for study. Study was conducted during September and October 2019. After taking informed consent of participants, data collection was carried through interview using pre-designed, pre-tested semi-structured interview schedules. Ethical clearance was obtained from institutional ethical committee. Association between variables was assessed with Chi-square test. Variables showing statistically significant association with the outcome variables (p-value of less than 0.05) were considered using software statistical package (SPSS version. 21.0).

Results

Table No.1: Exploring impact of Smart phones usage on interpersonal relationship of students

1.How many conversations were there at that moment		
Number of conversations	Number of people	percentage
a. (1-3)	160	40%
b. (4-5)	95	23.75%
c. (more than 5)	75	18.75%
d. (more than 10)	20	5%
e. (more than 15)	50	12.5%
2. How many conversations they had from the previous day		
Conversations from yesterday	Number of people	Percentage
a. (1-3)	130	32.5%
b. (4-5)	95	23.75%
c. (more than 5)	85	21.25%
d. (more than 10)	90	22.5%
3. How quickly they respond to messages		
Response time	Number of people	Percentage
a.(within minutes)	135	33.75%
b.(within hours)	215	53.75%
c.(within a day)	50	12.5%
4. How quickly they respond to messages while they are busy		
Response time to emails	Number of people	Percentage
a.(within minutes)	30	7.5%
b.(within hours)	70	17.5%
c.(within the day)	300	75%
Response time while busy	Number of people	Percentage
a.(within minutes)	80	20%
b.(within hours)	220	55%
c.(within the day)	100	25%

Cont... Table No.1: Exploring impact of Smart phones usage on interpersonal relationship of students

5. How quickly they respond to emails		
Response time while busy	Number of people	Percentage
a.(within minutes)	80	20%
b.(within hours)	220	55%
c.(within the day)	100	25%

Table No.2. Increase awareness about negative effects of Smart mobile phone.

1. To what extent does mobile usage affect their work		
Extent to which mobile effect their work	Number of people	Percentage
a.(Occasionally)	195	48.75%
b.(Often)	165	41.25%
c.(Frequently)	40	10%
2. Do they use their phone when in car with someone else		
Mobile usage with someone	Number of people	Percentage
a. Yes	245	61.25%
b. No	155	38.75%
3. Where they keep their phone during meals		
Where they keep mobile while having meals	Number of people	Percentage
a. In pocket	220	55%
b. On the table	130	32.5%
c. Turned off	5	1.6%
d. On silent	15	3.75%
e. Not with them	30	7.5%
Use of mobile while having meal with someone	Number of people	Percentage
a. Occasionally	175	43.75%
b. Often	115	28.75%
c. Every time	40	10%
d. Never	70	17.5%
4. How often they use their phone while having meal with someone else		
Use of mobile while having meal with someone	Number of people	Percentage
e. Occasionally	175	43.75%
f. Often	115	28.75%
g. Every time	40	10%
h. Never	70	17.5%

Table no.3: Response to messages during meal and effects of Smart mobile phone.

1. Response to messages during meal		
Response to messages during meals	Number of people	Percentage
a. Read only	170	42.5%
b. Read and respond	130	32.5%
c. Do not read	100	25%
2. Do they prefer call or text		
Calls or text	Number of people	Percentage
a. Call	225	56.25%
b. Text	175	43.75%
3: Purpose of using mobile		
Purpose of mobile phone	Number of people	Percentage
a. Social connectivity	215	53.75%
b. Entertainment	135	33.75%
c. Pictures/ Photographs	50	12.5%
4. Feeling when somebody uses phone while with them		
Feelings	Number of people	Percentage
a. Neutral	150	37.5%
b. Upset	20	5%
c. Angry	30	7.5%
d. Happy	10	2.5%
e. Irritated	100	25%
f. They are on phone	90	18%
5. At what time phone usage is maximum		
Time	Number of people	Percentage
a. Night	190	47.5%
b. Evening	150	37.5%
c. Day	60	15%

In this study we analyzed how and to what extent does using mobile phone affect their interpersonal relations. Students are more connected to the virtual world rather than the real world. Approximately, 23.75% students had 4-5 conversations via text messages going on that moment and 12.5% had more than 15 conversations. 75% of the students respond within minutes or in an hour while only 25% delay responding to the messages.

The study also shows that mobile phone usage affect their work quite frequently as they use their phone while working. Approximately 53.75% students use their phone maximum at night for socializing virtually (Face book , Instagram, Twitter, etc).

Approximately 67% students said they use their phones in presence of somebody else such as being in car with somebody, or while having meals together. This

shows that they don't spend value time with the people around them because they are busy connecting with people virtually through their phone.

When asked how they felt when somebody else uses their phone in their presence 40% students said they did not mind (18% are on their phone as well), while 37.5% students felt irritated or angry.

Discussion

The popularity of Mobile phone and social media has grown rapidly in recent years. Smart phone is an advance technology in late three decades. [6] The additional features of Smartphone have attracted people across all walks of life including the students. [7]

Initially, mobile phones were used only as a communication tool. But, these days, also support a wide range of other services such as music player, internet, video camera, calculator, alarm clock, text messaging, E-mail, internet access, short-range wireless communications (infrared, Bluetooth), business applications, gaming, photography and many more other perceived benefits as increased accessibility and social connectivity, reduced loneliness, and security in emergency situations. Inappropriate use of mobile phone by students presents many deleterious effects, for example, poor academic performances accidents while driving, damaged relationships owing to preference to phone calls by ignoring other members, and increased freedom from parents along with decreased social freedom. [8-13]

Dental/Medical students may also show cognitive/behavioral salience in which they constantly think about their phones when they are not using it or keep on checking their mobile phones for missed calls or messages. Almost 87-90% of the population in an advanced country like the USA, use cell phones, and a sizeable number of these is school and college going students. Smart phones are now in use in medical education for various purposes as sources of medical information, reference and, a guide in problem-based learning. and journals. Some medical schools are facilitating this by offering tablets or Smart phones to their medical students. [14-17]

A study done by Varshny AM et al (2017) revealed that before educational intervention 34% of students

used their Smart phones for less than 4 hrs, 50% used for voice calling, 31% for gaming, 15% for news and Infotainment, 75% for social networking, 61% for music and 14% for other uses. 21% students had productive impact, 56% feel happy, 7% feel grateful, 21% distracted, 3% feel frustrated and 4% feel angry. 72% students kept it with themselves, 37% had positive and 63% had negative impact, 37% kept it beneath the pillow, 24% kept it on charging dock and 44% kept it on side table. Smart phones newer affects in 25% students, affect sometimes in 67%, often in 6% and always in 2%. 88% of the students were aware of the harmful effects of Smart phones. [18]

A study done by Varshny AM et al (2015) revealed that Academic performance of 120 (65.93%) students declined while 40 (21.97%) students did better in academic. [19]

In a study done by Ahmad S. et al. (2016) revealed that health Professionals including medical students and doctors and there are a growing number of well-established blogs and internet forums that are aimed specifically at medical professionals. [20]

A study done by Agarwal G, Ahmad S, et al. (2016) suggested that the use of personal accessories such as cell phones, writing pens and their association with nosocomial infections in the hospitals is a matter of concern. Cell phones and stationery could be the source of bacterial infection transmission in the hospitals. Therefore, the infection control precautions by medical personnel such as regular hand hygiene before the devices use, their decontamination, and developing guidelines in this respect could be very helpful. [21]

Conclusion

In India, Smart phones are becoming increasingly common in both personal and professional spheres. Applications on smart phones are very popular and instant messaging is an upcoming form of communication for students. Unfortunately, communication technology has some negative effects also. In spite of some knowledge on unfavorable health effects, mobile phones are gaining popularity among young medical and dental students. Smartphone are the most popular choice among dental students. Excessive Smartphone use has been found to be associated with mental and physical health

problem in people of all age groups. Dental students are aware of the fact that mobile phone is responsible for ecosystem disturbances and health ailments. But, they did not reduce the usage of mobile phones by students. According to our survey, usage of mobile phone is affecting the relations and bonding between the students and their family members, as they are more connected with the virtual world through their mobile phones rather than the real world. There's need to apply more effort in developing mobile technologies that fit the needs of students.

Acknowledgement: The authors are thankful to all students who participated in this study

Funding: No funding sources

Conflict of Interest: There is no Conflict of interest

Ethical Approval: The study was approved by the Institutional Ethics Committee of Subharti Medical College Meerut UP

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To Evaluation the Levels of Serum Uric Acid and Triglyceride in Metabolic Syndrome

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Abstract

Introduction: Serum uric acid levels have been reported to be associated with a variety of cardiovascular conditions. Metabolic syndrome (MetS) consists of central obesity, hypertriglyceridemia, low HDL cholesterol, hyperglycemia and hypertension.

Aim: Serum uric acid and its correlation with triglyceride in metabolic syndrome.

Material and methods: 100 patients with MetS were conveniently recruited. For the purpose of analysis study participants were grouped into, group-1(control) and group-2 (case) triacylglycerol was defined with cut-off ≥ 150 mg/dl in both men and women. Uric acid in Males: 3.5-7.2 mg/dl, Females: 2.6-6.0 mg/dl. Metabolic syndrome was defined by the National Cholesterol Education Program Adult Treatment Panel III Criteria with adjusted waist circumference cutoffs (90 cm for males; 80 cm for females). The association between serum uric acid quartiles and metabolic syndrome was assessed using multivariate logistic regression.

Result: Shows mean uric acid in cases 6.20 ± 1.56 and in controls $4.6840 \pm .6264119$, highly significant (p .000). Shows triglyceride in cases 197.86 ± 122.500 and in controls 127.22 ± 28.524 , highly significant (p.000).

Conclusion: When compared among males and females, there was increased percentage of elevated serum uric acid in females. Metabolic syndrome is a group of risk factors that include abdominal fat, high uric acid and unhealthy cholesterol levels.

Keywords: Metabolic syndrome, triglycerides, high-density lipoprotein, low-density lipoprotein, very low density lipoprotein

Introduction

Metabolic syndrome (MetS) refers to a group of inter-related risk factors that include hyperglycemia, elevated blood pressure (BP), elevated triglycerides (TG), high-density lipoprotein (HDL) levels, and obesity (in particular, central obesity)¹. Metabolic syndrome was determined according to the criteria of the National Cholesterol Education Program Adult Treatment Panel III. Hypertriglyceridemia is often observed in subjects with MetS, type 2 diabetes, stroke, or combined with hyperlipidemia^{2,3}. The level of TG is an independent risk factor for CVD events, independent of serum HDL or low-density lipoprotein (LDL) levels⁴. Increase

triglyceride levels are often related to non-alcoholic fatty liver disease in persons having obesity as well as insulin. Therefore, hypertriglyceridemia can be studied more as a symptom suggesting super nutrition and an altered metabolic status leading to status which might develop clinical manifestation of the metabolic syndrome or can remain as a pure indication of super nutrition⁵. hypertriglyceridemia, the hallmark of the MetS, is summarized as (a) increased flux of free fatty acids, (b) raised TG values, (c) low high density lipoprotein (HDL) cholesterol values, (d) increased small, dense low density lipoprotein (LDL) values, and (e) raised apolipoprotein (apo) B⁶. The hypertriglyceridemia in MetS patients may be caused by a combination of overproduction

of very low density lipoprotein (VLDL) apo B-100, decreased catabolism of apo B containing particles, and increased catabolism of HDL-apo A-I particles. These abnormalities may be the consequence of a global metabolic effect of insulin resistance. Although the underlying mechanisms for this pattern are not fully understood, a cascade of events has been proposed for the observed phenotype, which ties in with all of the abnormalities present in these disorders. Uric acid is the end product of dietary and endogenous purine metabolism in humans⁷. Serum Uric Acid (SUA) concentrations depend on the balance between the intake, endogenous synthesis, excretion ratio and metabolism of purines. Any alteration in the balance between these factors could trigger hyperuricaemia, defined as a Serum uric acid concentration >6.8 mg/dL⁸. Studies have shown that high concentrations of SUA have been associated with an early onset of hypertension and predicts rise in blood pressure, an increase in body and triglyceride levels^{9,10}. MetS is an important public health problem affecting nearly 25.9% of the world population. Earlier studies demonstrated high prevalence of MetS among patients with gout. Some authors claimed the existence of association between hyperuricemia and MetS even in healthy individuals^{11,12}. Many cross-sectional studies have demonstrated a relationship between increased SUA concentrations and MetS prevalence.^{13,14}

Material and Method

The present study was conducted in the Department of Biochemistry, Maharishi Markandeshwar institute of medical sciences and research, Mullana, Ambala. Total no of 100 subjects were selected for the study. The study was conducted from June 2016 to February 2017. Out of 100 subjects 50 were cases and 50 were controls. Patients with type-1 diabetes mellitus, chronic kidney disease, lymphoproliferative disorders, haemolytic disorder, myeloproliferative disorder,

Using drugs like salicylates, diuretics, like levodopa, nicotinic acid and who consume alcohol ≥ 10 g/day were excluded from the study. Serum uric acid levels the total 100 subjects were divided into group namely, control (N=50) and cases (N=50). MetS subjects with serum uric acid <6.8 mg/dl served as control and >6.8 mg/dl considered as cases. The blood pressure and anthropometric measurements including weight, height,

and waist circumferences were noted and accordingly body mass index (BMI) was calculated. All the other biochemical parameters and serum uric acid levels were measured by using auto analyser.

Discussion

The increased level of serum uric acid is also a risk factor of metabolic syndrome. High uric acid level is widely recognized 'stand-alone' or independent risk factors for atherosclerotic diseases such as dyslipidemia and hypertension.¹⁵ In our study, the subjects were between 20-75 years of age and it was found that the prevalence of metabolic syndrome along with uric acid came out to be 32 (64%) out of 50 cases. In current studies metabolic syndrome individual have a 30-40% chance of developing diabetes and CVD within 20 years. It is expected that there is a prevalence of more than 25% of metabolic syndrome in United States in adult population. Indian populations are a high risk with respect to CVD and Diabetes. The sex distribution was 56.75% males and 46.71% females. The study (Hochberg et al., 2003) revealed that the incidence of raised uric acid levels in men was 19%, which is more than women.¹⁶ There was a considerable change demographically in hyperuricemic MetS subjects. Maximum percentage was seen above the age of 40 years (64%). In our study, gender specific percentage was 28% in males and 34% in females. Uric acid levels (along with Mets) are more in females than males. In previous studies it was found that prevalence was more in males than females. Our study showed percentage of subjects of metabolic syndrome having increased triglyceride levels. 38% cases had >175 mg/dl followed by 50% within the range 70-175mg/dl. The association of metabolic syndrome and triglyceride was found highly significant ($p=0.000$). triglycerides level in cases and controls camped to 86% of control, only 44% of MetS cases had TG levels below 150mg/dl and less, 38% of MetS cases had high triglyceride levels >175 mg/dl. Primarily, lipid abnormality includes hypertriglyceridemia and low levels of HDL-Cholesterol concentration. People with the metabolic syndrome may have some lipid abnormalities in addition and include increased small, dense, LDL, particle and non high density lipoprotein-cholesterol fractions: IDL and VLDL. Characteristic feature of atherogenic dyslipidemia is manifested by increased levels of triglyceride, low highdensity

lipoprotein cholesterol, increased small dense LDL particles and normal to slightly elevated LDL-C.¹⁷In one of the recent studies, a survey was done in north India which established the result that the incidence of metabolic syndrome in adolescent was around 4.2%. This study in obese and adolescent children indicated the significant correlation of lipid to uric acid and the uric acid was a dependable sign of metabolic syndrome.

¹⁸In a study by Hochberg *et al.* revealed the incidence of raised value of uric acid in males was 19.07%, which is more increased than that in females (3.42%). It may be accredited to estrogen helping uric acid excretion. Raised value of uric acid is highly common medical problem not only in the advanced countries, but also in the developing countries.

Table 1: Uric Acid in females in Cases and controls:

URIC ACID (mg/dl)	FEMALES(CASE) (N= 25)	CONTROL
2-6	12	21
6.1-12	13	0

Out of 25 cases, 12 Females had Uric acid in the range 2-6 mg/dl and 13 females had between 6.1-12mg/dl

Table 2: Uric acid levels in males in cases and controls:

URIC ACID (mg/dl)	MALES (CASE) (N= 25)	CONTROL
2-7	16	29
7.1-12	09	0

Out of 25 cases, 16 males had Uric acid in the range 2-7 mg/dl and 9 males had between 7.1- 12mg/dl

Table 3: Mean value standard deviation and p value of Uric acid in cases and controls.

Table 3: shows mean uric acid in cases 6.206 ± 1.566 and in controls $4.784 \pm .6264$, highly significant (p .000) **.

Table 4: Mean value, standard deviation and p value of triglyceride in case and control.

Triglyceride (mg/dl)	No. of subjects	Mean± Std. D	Significance
Cases	50	197.86±125.588	.000**
Control	50	127.22±28.524	.000**

Table 4: Shows mean triglyceride in case 197.86 ± 125.588 and in control 127.22 ± 28.524 , highly significance (p .000)**.

Conclusion

The association of hyperuricemia and hypertriglyceridemia with metabolic syndrome has long been recognized. Treatment should be focused on

tackling each of these conditions. By adopting some healthy habits, we may be able to eliminate these risk factors completely. Every step counts and our hard work and attention to these areas will mark a difference in our

health.

Ethical Clearance: The study protocol was approved by the ethical committee of Institute for Maharishi Markandeshwar Institute of medical sciences and Research, Mullana, Ambala, Haryana.

Conflict of Interest: Nil

Source of Funding: Self

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Complementary and Alternative Medicinal Use amongst Antenatal in a Rural Tertiary Care Hospital of Haryana

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Abstract

Background - WHO defines 'Traditional medicine' as the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses.

Aims and Objective - To study Complementary and alternative medicinal use in addition to allopathic medicine amongst pregnant women visiting antenatal clinics in a rural tertiary care hospital of Haryana.

Material and Method – Antenatal women attending the Outpatient Department in a tertiary care hospital situated in a rural area in Haryana.

Study Design – A prospective , cross sectional study

Result – A total of 128 pregnant women participated in the study. Majority of these i.e 83% reported use of CAM during pregnancy. However pregnant women came forward with history of CAM use only after great persuasion.

Conclusion –CAM is commonly used by majority of pregnant women in antenatal period. Rural women with low sociodemographic status with lesser education , home maker and unbooked pregnancy are vulnerable group for the CAM use. Moreover extremely low level of communication between CAM user and health care provider is worrisome and demands that physician should inquire their patients about the use of CAM.

Key words: CAM: Complementary and alternative medicine, pregnant, antenatal.

Introduction

WHO defines 'Traditional medicine' as the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses. The terms complementary/alternative/

non-conventional medicine are used interchangeably with traditional medicine. [1] An estimate reveals that over 80% of the population in Asia and Africa depend upon the traditional medicines for their primary health care. [2] The WHO estimates that in many developed countries, 70% to 80% of the population has used some form of CAM including Ayurvedic, homeopathic, naturopathic, traditional, Native Indian medicine.[3] Studies have shown that women use these traditional medicines more prolifically even when they are pregnant. [4] Of course, these native medicines may have many a beneficial effects but have adverse ill effects on mother and fetus. The indiscriminate or non- regulated use of several herbal medicines may put health of their users and fetus

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at risk of toxicity and fetal malformations. [5,6] Their ill-effects may manifest because of their own or due to an interaction with allopathic drugs. The latter may happen when they fail to disclose about the use of CAM to the prescribing doctor. Uterine inertia and abortion have been reported amongst the antenatal women taking these CAM in few Studies. [7,8] Very few studies have been done in India and none in this part of our country that has assessed the use of CAM in pregnant women. Thus present study has been done to evaluate the use of CAM amongst antenatal women.

Aim & Objectives

To study CAM use amongst pregnant women visiting antenatal clinics in department of obstetrics and gynaecology, MMIMSR deemed to be University Mullana- a rural tertiary care hospital in Haryana.

Objectives

Primary

To study the use of CAM amongst pregnant women attending antenatal clinic in Department of Obstetrics and Gynaecology ,MMIMSR.

Secondary

To assess correlation of CAM used with socio-demographic characteristics in antenatal women.

To study beneficial and adverse effects of CAM on pregnant mother.

To evaluate beneficial and adverse effect on fetus.

Material and Method

This study was conducted in antenatal clinic outpatient department of Obstetrics & Gynaecology in Maharishi Markandeshwar Institute of Medical Sciences & Research Mullana, Ambala a rural tertiary care hospital of Haryana after approval by the institutional ethical committee. All antenatal women willing to participate in study. A structured questionnaire were developed and vernacular translation in Hindi was utilised in participants not well versed with English. Data was collected using proforma meeting the objectives of the study after an informed written consent from participants. The questionnaire were validated by a team of experts. Pregnant women were counselled regarding aim of the study.

Inclusion Criteria:

Antenatal women attending Outpatient Department in a tertiary care hospital- a rural area in Haryana, willing to participate in study.

Exclusion Criteria:

Unwilling to share information and refusal to give consent to participate in survey.

Methodology

TABLE 1: DISTRIBUTION OF ANTENATAL WOMEN ACCORDING TO GRAVIDITY

GRAVIDA	TOTAL(N=128)	CAM USERS(N=106)
PRIMI	43(34%)	38(36%)
SECOND	64(50%)	51(49%)
THIRD	15(12%)	13(12%)
>FOUR	06(4%)	04(3%)

TABLE 2: DISTRIBUTION OF ANTENATAL CASES IN RELATION TO SEX OF PREVIOUS CHILD.

SEX OF PREVIOUS CHILD	TOTAL	CAM- USERS(N=106)	NON-CAM USERS(N=22)
NO PREVIOUS CHILD	43(34%)	38(36%)	05(23%)
BOTH FEMALE AND MALE	21(16%)	17(16%)	04(18%)
FEMALE ONLY	56(44%)	50(47.1%)	06(27%)
MALE ONLY	8(6%)	01(0.9%)	7(32%)

TABLE 3: DISTRIBUTION OF ANTENATAL CASES ACCORDING TO THE TYPE OF CAM USED (N=106).

TYPES OF CAM	NUMBER OF USERS	PERCENTAGE
GINGER	76	71%
HONEY	76	71%
ALMONDS	53	50%
GOAT MILK	21	20%
HERBS WITH DESI GHEE	35	33%
UNKNOWN	41	39%

MORE THAN ONE TYPE OF CAM WAS USED BY PREGNANT WOMEN

TABLE 4: DISTRIBUTION OF ANTENATAL CAM USERS ACCORDING TO SOURCE OF PRESCRIPTION.

	CAM User	PERCENTAGE
FAMILY/FRIENDS	53	50%
RELIGIOUS GROUP(BABA, HAKIM)	41	38.6%
HEALTHCARE PROFESSIONALS	12	11.4%

TABLE 5: DISTRIBUTION OF ANTENATAL CASES IN RELATION TO MATERNAL AND FETAL ADVERSE EFFECTS.

COMPLICATIONS (N=15)	CAM USERS N=12 (80%)	NON CAM USERS N=3 (20%)
MISSED ABORTIONS	4(33%)	-
AMBIGUOUS GENITALA	3(25%)	-
IUD	2(17%)	-
ANENCEPHALY	2(17%)	-
ACARDIAC TWIN	1(8%)	1(33%)
HYDROCEPHALUS	-	2(67%)

TABLE 6: DISTRIBUTION OF ANTENATAL CAM USERS IN RELATION TO REASONS FOR USING CAM AND SATISFACTION WITH CAM

CAM USED	REASONS FOR CAM USE	NUMBER OF USERS(106)	SATISFIED	NON- SATISFIED
GINGER AND HONEY	RELIEF OF NAUSEA, VOMITTING AND DYSPEPSIA	75 (71%)	72(96%)	03(4%)
HERBS AND DESI GHEE	FAMILY AND FRIENDS TRADITIONS FOR USING HERBS (MATERNAL WELL BEING)	24(23%)	24(100%)	-
GOAT MILK AND ALMONDS	GROWTH OF FOETUS	56(53%)	41(73%)	15(27%)
UNKNOWN	DESIRE FOR MALE FOETUS	41(39%)	16(39%)	25(61%)

Results

A total of 128 pregnant women participated in study. Majority of these i.e 83% (N=106) reported use of CAM during pregnancy . However pregnant women came forward with history of CAM use only after great persuasion.78(74%) CAM users were unbooked pregnancies.82% of CAM users were in the age group of 21-30 years. Only 9.4% pregnant CAM users were below 20 years of age and 8.6% above 31 years of age. 76.5% of CAM users were educated less than or upto class 12th only. 21 (16%) of pregnant CAM users did not go to school. 50% CAM users were from lower middle class, 23% from upper lower and 16% from lower socio economic status. Only 11% CAM users belonged to upper middle class. 93% CAM users were residing in rural areas,89% were home makers. Unbooked pregnancy, low socioeconomic status, lower education, home makers with rural background were positively associated with utilisation of CAM.

Out of total 106 CAM users 38(36%) were primigravida, 51 (49%) were second gravida while only 12% and 3% were third and fourth gravida or more respectively(Table 1).

Half of CAM users (50%) had previous female children only followed by 36% primigravida. Only one (0.9%) case with previous male child opted for CAM use(Table 2).

Ginger and honey was most commonly used CAM in 71% pregnant women in our study for relief of nausea, vomiting and dyspepsia and amongst these 96% of users were satisfied with treatment. Use of herbs with desi ghee was used by 23% for maternal health with 100% satisfaction. Goat milk and almonds was used by 53% and amongst these 73% had satisfaction for fetal growth. CAM of unknown ingredients prescribed by sant/baba was used by 49 (39%) women for having male child but 61% were not satisfied due to adverse fetal effects(Table 3). Among CAM users 76% reported use of ginger and honey, 50% used almonds, 33% used herbs with desi ghee and 20% used goat milk while 39% of the CAM used were of unknown constituent prescribed by sant or hakim(Table 3). Majority of pregnant women were using more than one type of CAM

In 50% CAM was advised by senior members of family and friends. 38.6% of CAM was supplied by religious group of prescribers i.e sant or hakim. CAM used in this group contributed maximum number of fetal adverse outcomes due to unknown constituents of CAM (Table 4).

Out of 106 CAM users adverse maternal and fetal outcome were reported in twelve cases. Four patients (33%) had missed abortion, ambiguous genitalia in three cases(25%), anencephaly in two cases(17%) ,fetal acardia with TRAP in monozygotic twin in one case and intra uterine death in two cases were some of the adverse

fetal outcome reported among CAM users (Table 5).

Many of the pregnant women were taking more than one type of CAM. About 71% of the CAM users considered its use for relief of nausea and vomiting, 53% for the safety of the fetus and 23% for the safety of fetus. 96% of the patients using ginger and honey were satisfied by its beneficial effects. Also 39% of the patient used CAM for the desire of male baby out of which 61% were unsatisfied due to major adverse outcomes in baby seen (Table 6).

Discussion

This study has been done to find out prevalence for CAM use among pregnant women and to know about its beneficial and adverse effects. The study followed prospective cross-sectional design and gathered information on the use of CAM by pregnant women who visited outpatient department of MMIMSR. We found that 83% of pregnant women used at least one modality of CAM during pregnancy. Our study showed significantly higher number of CAM users. However it is much higher as compared to other studies conducted in Palestine, Malaysia, Egypt, Taiwan^[9-12]. These variations in the prevalence of CAM are due to difference in the proportion of CAM usage by number of factors such as design of study, difference in socio-demographic characteristics and different cultural traditions across the globe. Unbooked pregnancy, reproductive age group 21-30 years, lower education below class 12, lower socioeconomic status, rural background with home makers were using CAM to a great extent in our study. Commonly used CAM was ginger and honey in 71% pregnant women for nausea, vomiting and dyspepsia with highest level of satisfaction (96%) and no adverse effect. WHO also recommends ginger and honey for nausea in pregnant women^[13]. Ginger consists of antiemetic properties, which not only help in digestion, but also suppress nausea. In relation to its antiemetic properties, ginger acts peripherally, within the gastrointestinal tract, by increasing the gastric tone and motility due to anticholinergic and antiserotonergic actions^[14-15]. It is also reported to increase gastric emptying.^[16] This combination of functions explains the widely accepted ability of ginger to relieve symptoms such as dyspepsia, abdominal pain, and nausea, which is often associated with decreased gastric motility. Use of

almonds, goat milk, herbs with desi ghee has been part of Indian tradition since time immemorial, same were used in 50%, 20% and 33% respectively by pregnant mothers for maternal and fetal wellbeing

It has been documented that congenital abnormalities caused by human teratogenic drugs accounts for less than one percent of total congenital abnormalities.^[17] In our present study the adverse fetal complications were seen in fifteen cases out of which unknown CAM was observed in twelve (80%) cases and the fetal complications were ambiguous genitalia, anencephaly, IUD, acardiac twin and missed abortions.

Public and private health care professionals and skilled health care provider are right source for antenatal check-up, treatment and drug advise and are important sources for information and guidance about health matters, but our patient also rely on wide range of other sources including senior member of family and friends (50%), alternative practitioners (11.4%) and religious group sant / baba or hakim (38.6%) for medication. It is essential for the physicians to understand what the patient are doing to seek health, as this understanding is important to harness potential benefits to help patients to avoid harm. The reasons why patients uses CAM could be due to conventional medicine too expensive, test cost, thought about the conventional medicine would not help, and thought about the additional benefits of combining conventional medicine with CAM. Other common reason was self-help approach to health and wellness as advice by their family members and friends.

The major complications which occurred in unknown CAM users could be due to its easy availability, poor knowledge, high cost of conventional medicines. So it is important to examine the pattern of the drug used in pregnancy and to see to what extent there may be room for the improvement as pregnancy is a special physiological condition where drug treatment is a special concern. Careful counselling and consideration is need of hour as the health of the mother and unborn child life is at stake.

Conclusion

CAM is commonly used by majority of pregnant women in antenatal period. Moreover extremely low level of communication between CAM user and health

care provider is worrisome and demands that physician should inquire their patients about the use of CAM due to scarcity of evidence in support of CAM benefits during pregnancy, it is very important to educate women on safe use of CAM especially during antenatal period with special reference to rural with low socio economic status, unbooked cases and low literate population. Based on result of our research, further studies with large population in CAM users with its beneficial and adverse effects is needed to be evaluated.

Conflict of Interest: None

Funding: None

Ethical Clearance: Approved

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A Review of the Role of Thoracic Imaging in Clinical Practice in a Tertiary Care Centre in Eastern India

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Abstract

Background: The wide availability of Computed tomography (CT) imaging facility in recent years, even in district or sub-district level, has demanded proper evaluation of the trend of its utilisation and assessment of benefit in diagnosis of different diseases. **Material & methods:** It is a retrospective analytic study of CT thorax images along with its medical records in a tertiary care hospital in sub-urban locality of a metropolitan city over a period of one year. Minitab software (version 15.1.0.0) used for statistical analysis. **Result:** 226 CT thorax images reviewed; 71% referred from pulmonary Medicine department and mostly from Pulmonary Medicine out-patient department (60.6%). Overall, the final diagnosis obtained with CT imaging remained unaltered in 62.8% of cases. However, among those with discordant radiological diagnosis, normal CT images were the most common finding (29.8%); infective aetiology was the most common pre-test provisional diagnosis among these patients. **Conclusion:** CT imaging is immensely helpful for critical decision making regarding management. However, it should be utilised more judiciously specially when dealing with suspected pulmonary infections, especially in resource constrained set-up.

Key words: HRCT thorax, discordant clinico-radiological diagnosis, ILD, Consolidation

Introduction

The scope of chest radiography in clinical diagnosis has expanded widely with advent of computed tomography scan (CT scan) of thorax, and more so with introduction of high resolution CT (HRCT), spiral CT and multidetector spiral CT. [1] Each of these modalities are highly sensitive and specific in detecting different lung pathology e.g., HRCT for diffuse lung disease, spiral CT and multidetector spiral CT for imaging of airways, pulmonary and systemic vessels and lung nodules. Not only lung parenchyma and airways, CT thorax with or without contrast enhancement

play a very important role in detecting pulmonary thromboembolism^[2], mediastinal pathology^[3], chest CT incidentalomas^[4], pleural and chest wall pathology, metabolic and storage lung diseases^[5] and often cardiac conditions like valvular calcifications, right ventricular dilatation, right ventricular thrombus and many others. [6] A prospective study was conducted by Turner MO et al in British Columbia almost a decade earlier, where a questionnaire-based survey was done on the physicians, before and after the imaging study. They found that diagnosis was revised in 48% of cases among 454 cases following CT scan. [7] Hu SY et al found that the utilisation of CT imaging in Emergency Department has increased over time though its cost-effectiveness need to be determined by further extensive studies. [8] Zhou JC et al concluded that CT utilisation during emergency department (ED) visit was associated with more number

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of emergency operations at the expense of raised cost of treatment and longer hospital stay.^[9] SI Kamel et al have analysed trend of utilisation of non-cardiac thoracic imaging over a decade – there has been steady increase in CT angiography (CTA), little fluctuations in utilisation of CT imaging facilities and gross decline in utilisation of chest x-ray s.^[10] The availability of thoracic imaging facilities has expanded widely during last few years even in the district and sub-district level in eastern India. It is now very relevant to review the trend of utilisation of such diagnostic modality by general physicians, respiratory physicians and intensivist. Even after extensive literature review we could find no published report in this regard from this subcontinent.

Aims & Objectives

The aim of the present study is to find out the trend of utilisation of CT imaging of thorax in a tertiary care hospital in Eastern India.

The objectives of the study are:

1. To review the indications for advising CT imaging of thorax by emergency physicians, intensivist or respiratory physicians
2. To find out degree of agreement between pre-test provisional diagnosis and post-test final diagnosis.

Material and Method

Study design: The study is a descriptive retrospective observational study

Study setting: Radiology department of a tertiary care hospital in suburbs of a metropolitan city in Eastern India. The GE 16 slice multi-detector CT scan machine was used for the study.

Study period: In this study, the clinical and radiological data from one year retrospective cohort (June 2018 to May 2019) was collected from the radiology department for analysis.

Study population: In this study the patients referred for CT imaging studies of chest including contrast enhanced or non-enhanced CT and High Resolution Computed Tomography (HRCT) of thorax in preceding one year was included as study population. The provisional diagnosis as mentioned in the requisition

form and clinical data obtained before the actual test was noted. The radiological interpretation was done by two experts from the Department of Radiology separately. If there was any discordant opinion, the final diagnosis was obtained after discussion with a third referee radiologist. The final radiological diagnosis was compared with the provisional clinical diagnosis.

Inclusion criteria: The patients, aged more than 12 years, who were referred for contrast-enhanced or non-enhanced CT thorax or HRCT thorax from Out-Patient or In-patient department of Pulmonary Medicine, General Medicine, Emergency department and other departments of the hospital, irrespective of gender, comorbid conditions and past medical or surgical history were included in the study.

Exclusion criteria: Those with incomplete clinical data sheet were excluded from the study. The patients from the paediatric ward or OPD (age group 12 yrs and less) were excluded from the study.

The study was conducted after obtaining approval from the institutional Ethics Committee.

Statistical analysis: Data entry was done using MS Excel, 2012 and statistical analysis was performed using Minitab software (version 15.1.0.0; Minitab, State college, PA). The data were compiled as mean \pm SD for data with normal distribution and frequency distribution chart.

Results

The study reviewed total 315 cases. However 89 cases were excluded as detailed clinical records were missing. 162 out of 226 (71.68%) were referred from Pulmonary Medicine department, 59 out of 226 (26.1%) from General Medicine department, and rest 5 from other departments. There was no significant age differences among male and female population in the study (142 male, 50.94 \pm 16.9 yrs vs. 84 Female, 50.55 \pm 15.19yrs, p value = 0.8621). Most of the male population were smoker (82 out of 142, 57.7%) while female were mostly non-smoker (79 out of 84, 84%). The common provisional clinical diagnosis were pulmonary infection (155 out of 226, 68.6%), obstructive airway diseases (33, 14.6%), malignant condition (12, 5.3%), suspected ILD (9, 3.9%), pleural disease (6, 2.7%),

bronchiectasis (5, 2.2%) and miscellaneous disease conditions. The two most common radiological findings were consolidation (93/ 226, 41.2%) and nodules (63/226, 27.9%) (Table1). The other findings were cyst, ground glass opacity, bronchiectasis, reticular shadows, honeycombing, cavity and mass, in decreasing order of frequency. Among pleural pathology, pleural effusion was most commonly seen (50/226, 22.1%). Pleural calcification, hydropneumothorax and pleural nodules were among other pleural lesions identified among the study population. However, CT findings were absolutely normal in 26 patients (11.5%). Most of the patients with normal CT imaging (21 out of 26, 80.8%) were referred with the clinical diagnosis of pulmonary infection. Among those with normal CT finding, 3 (three) were investigated as post-operative follow up patient of bronchogenic carcinoma and other two were suffering from obstructive airway disease. The most common radiological diagnosis in patients requested for CT thorax was tuberculosis (56/226, 24.8%). The infiltration and / or consolidation (40 out of 56), centrilobular nodules (32 out of 56), pleural effusion and/or hydropneumothorax (21 out of 56) and cavity (13 out of 56) were the most common findings in patients with active tuberculosis. The top 10 radiological diagnosis other than active tuberculosis are given in Table:2.

In 142 out of 226 (62.8%), the pre-test provisional diagnosis tallies well with radiological findings (Table 3). Among those with discordant clinico-radiological diagnosis, the normal CT scan was the most common impression (26 out of 84, 30.9%); 21 out of 25 normal scan were advised CT imaging with provisional diagnosis of pulmonary infection, 2 had clinical diagnosis of obstructive airway disease and 3 were advised CT scan to rule out any metastatic deposit. The other radiological diagnosis among patients with discordant CT imaging were bronchiectasis (15 out of 84), Interstitial lung disease (ILD) (13 out of 84), lung mass was detected incidentally in 7 while clinical diagnosis was consolidation. Among those presented with working diagnosis of ILD, the radiological diagnosis was in concordance with clinical diagnosis in 6 out of 9. However most of the patients with radiological finding of UIP pattern or NSIP pattern presented during infective exacerbation and infective condition of lungs were the clinical working diagnosis.-

Discussion

In the present study 226 CT scan thorax records were reviewed. Most of the cases (71.68%) were referred from Pulmonary Medicine department, mainly from outpatient department (137 out of 162, 84%). The trend was almost similar in previous study by Turner MO et al who reviewed 454 thoracic CT scan, mostly from pulmonary medicine department (70%) and 80% from out-patient department. [7]

The most common pre-test provisional diagnosis in the present study was infective etiology in the form of pneumonia, tuberculosis, infective exacerbation of bronchiectasis and bronchitis (155 out of 226, 68.6%). Among those investigated for pulmonary infection, 13.5% had no identifiable radiological findings (21 out of 155). This high incidence of negative imaging may be due to the fact that imaging was advised in patients suffering from bronchitis to evaluate for pneumonia or else early initiation of empirical antibiotics managed the clinical condition before appearance of radiological opacities. Hess EP et al. reviewed 1,79,032 CT scans over a period of 10 years and found that CT abdomen and thorax were most commonly advised imaging studies; there was significant increase in CT imaging in Emergency Department (81% absolute increase), though overall CT utilisation remained same. They concluded that abdominal and thoracic CT scans should be targeted to increase appropriateness.^[11] Similarly in our study, CT scan was over-utilized (in the form of normal CT scan in 13.5%) in patients with suspected pulmonary infection. Garin N et al concluded in their study that Low dose CT scan is not always indicated in patients with suspected pneumonia, rather a simple prediction score could be an alternative tool of diagnosis with moderate accuracy.^[12] Larson DB et al showed there has been increased use of CT imaging by ED.^[13] So this can be area for intervention where CT scan could be advised more judiciously to improve efficacy of this highly sophisticated imaging facility and to reduce inappropriate radiation exposure.

The overall most common radiological finding was consolidation (93 out of 226, 41.1%), lobar, segmental, uni- or bi-lateral. Active pulmonary tuberculosis was detected in 56 out of 226 (24.7%), sequale of pulmonary kochs in 10 out of 226 (4.4%) and post tubercular residual

pleural thickening/calcification in 4 out of 226 (1.8%). The high occurrence of tuberculosis among the present study population may be due to the fact that the estimated TB incidence in India is quite high i.e., 27 lakh according to India TB report 2019. Though sputum mycobacterial culture and rapid diagnostic tests are confirmatory of active lesion, CT imaging is often advised to determine extent of involvement or complications if any. The most common radiological features of active pulmonary tuberculosis are centrilobular nodule, cavities, consolidation and tree-in-bud appearance as reported by Nachiappan AC et al.^[14] The other features of activity are miliary nodules, lymphadenopathy and pleural effusion.^[14] Hatipoglu ON et al also reported centrilobular nodules and tree-in-bud appearance as the most common radiological findings of active pulmonary tuberculosis.^[15] However in the present study consolidation and centrilobular nodule are the most common findings in active pulmonary tuberculosis. In the present study, among those who were clinically diagnosed with ILD, only few presented with classical signs and symptoms of ILD while most of them presented for the first time during an infective episode.

In our study the radiological diagnosis was different from clinical diagnosis in 84 out of 226 (37.1%); which included 26 with normal CT scan (11.5%) and 58 with changed diagnosis (25.6%). The finding was very similar to the previous study by Turner MO et al who interviewed physicians before and after imaging and concluded that CT scanning changed the clinical diagnosis in 48% cases; 25% had normal CT scan and 23% had different diagnosis.^[7]

The major limitation of the present study is the small study population. Since there is no available published article from this part of the world reviewing the trend of CT scan use and its role in clinical practice, it was not possible to compare the present data with respect to the local trend.

Conclusions

CT imaging is extremely valuable diagnostic tool. However it should be judiciously used particularly in patients presenting with clinical suspicion of infective etiology. The authors opine that traditional chest radiography may be considered before advising CT imaging in order to reduce inadvertent radiation

exposure. This present study may be conducted with larger population to find the trend of CT utilisation among different specialities and sub-specialities.

Table 1: The different radiological findings

Radiological description	Total number of patients
Consolidation	93
Nodules	63
Pleural effusion	50
Cyst	40
GGOs	36
Bronchiectasis	36
Reticular shadow	34
Honeycombing	16
Cavity	15
Mass	11
Air trapping	7
Lymphadenopathy	31

Table 2: Top 10 radiological diagnosis after ruling out active pulmonary tuberculosis

Radiological impression	Total number of patients
Consolidation	35
Bronchiectasis	22
ILD – UIP pattern	16
ILD – NSIP pattern	11
Lung mass	11
Sequel of Pulmonary koch's	10
Normal study	26
Pleural pathology	6

Table 3: Provisional diagnosis vs. radiological diagnosis

Provisional diagnosis	Normal	Same diagnosis	Different diagnosis	Total number of patients
Obstructive airway disease	2	14	17	33
Bronchiectasis		5		5
ILD		6	3	9
infective	21	100	34	155
Malignancy and metastatic disease	3 (post-surgery follow-up case)	9		12
Pleural diseases		5	1 (lung mass)	6
Misc. (Post-pneumonectomy, thyroid swelling, etc)		3	3	6
Total	26	142	58	226

Ethical Clearance: Obtained from Institutional Ethics Committee

Source of Funding: Self

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Sero-Prevalence of Transfusion Transmissible Infections in Blood Donors at Blood Bank of a Tertiary Care Hospital - an indicator of Blood Safety in the Region: A Study from North Haryana (India)

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Abstract

Background: Blood transfusion saves millions of lives worldwide each year but at the same time it is also associated with large number of complications including transfusion-transmissible infections (TTIs).

Aims and Objectives: To assess the seroprevalence of HIV, HBV, HCV, Syphilis and Malaria in blood donors

Setting: The Blood Bank of a Tertiary level Hospital in Haryana, India.

Study Design: A retrospective hospital record based study.

Material and Method: The study included blood donors of age group 18 - 65 years. Data of total 20918 blood donors was collected from July 2017 to August 2019.

Results: The seroprevalence of HCV, HBV, HIV, Malaria and Syphilis as reported in our study was 1.16 %, 0.78 %, 0.057 %, 0.014% and 0.124 % respectively.. Higher prevalence of TTIs were reported in replacement donors as compared to voluntary donors and in male compared to females.

Conclusion: Voluntary blood donor services are very much needed and should be encouraged along with stringent donor selection and latest screening assays.

Key words: Blood Donors, Blood Transfusion, HIV, HBV, HCV, TTI, Seroprevalence

Introduction

Blood transfusion saves millions of lives worldwide each year but at the same time it is also associated with

large number of complications including transmission of transfusion-transmissible infections (TTIs). Major infections which are transmitted by blood transfusion and mandatory for testing includes HIV, Hepatitis B, Hepatitis C, Syphilis and Malaria out of which HIV and Hepatitis are of major concern. An infected donor can transmit the infection during asymptomatic phase especially during window period which pose a great threat for the recipient as well as for the whole community. TTIs increases morbidity and mortality in the recipient, decreases the productivity of working force of the society.^[1]

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The adoption of newer and more sensitive screening tests like Nucleic Acid Amplification Technique (NAT) has significantly reduced the TTIs. But in India lack of health education in masses and compromised healthcare system results in rising incidence and prevalence of TTIs.^[2] The knowledge of seroprevalence of TTIs in the blood donors in a particular region gives an idea regarding the safety of blood transfusion, epidemiology of infections and helps in deciding the benefits versus risks of blood transfusion.^[3]

Material and Method

Study Area: Blood Bank under the Department of Pathology at Kalpana Chawla Government Medical College, Karnal (Haryana), India

Study Design: A retrospective hospital record based study using secondary data of blood bank.

Study participants: Apparently healthy blood donors of age group 18 to 65 years satisfying the criteria for blood donation.

Study size and sample: A total of 20918 blood units were collected.

Study Period: Data was collected over a period from July 2017 to August 2019.

Ethical Clearance: Ethical clearance was obtained from the Institutional Ethics Committee of the same institute.

Study tools and techniques: Blood was screened for HIV, HBV, HCV, Syphilis and Malaria as per NACO guidelines. The TTI testing was done with 4th generation ELISA for HIV and 3rd generation ELISA for HCV and HBV and crosschecked from the blood bags in case of reactive test results. Test for Syphilis was done by either RPR or Treponema pallidum card test (J. Mitra /ADVY chemicals). The test for Malaria was done by either peripheral blood smear or rapid card test.

Statistical Analysis: The statistical analysis was carried out using SPSS statistical version 20 and Minitab 14. The analysis includes frequency table, bar, pie chart, Chi-square and z-test for proportion. All statistical tests were seen at two-tailed level of significance ($p \leq 0.01$ and $p \leq 0.05$).

Funding: No funding sources

Conflict of Interest: None

Results

A total of 20918 blood units were collected out of which 20448 (97.75%) were donated by males and 470 (2.25 %) by females. A total of 18136 (86.71 %) contribution was made by voluntary donors and 2782 (13.29 %) was by replacement donors. More volunteers and male donated blood as compared to replacement and female donors respectively and this difference was observed to be statistically significant (p -value=.0001) (Table 1).

A total of 449 units were found to be reactive for TTIs with seroprevalence rate of 2.15%. The distribution of different TTIs is shown in Figure 1. Out of 18136 voluntary donors (VDs) , 376 (2.07 %) donors were found to be reactive and out of 2782 replacement donors (RDs) , 73 (2.62 %) donors were found to be reactive for TTIs (Table 2 and figure 2). Prevalence of TTIs in VD's (2.07 %) and RD's (2.62 %) that this difference is not statistically significant.

Out of 20448 male donors, 444 were found to be reactive and out of 470 female donors, 5 were found to be reactive for TTIs . Prevalence of TTIs in male donors was 2.17 % and female donors was 1.06 % (table 2). This difference between gender has been found to be statistically significant. Age wise distribution of different TTIs in shown in table no. 3. Out of the total 449 reactive, reactive cases amongst the age group (18-30 years) was 49.44 %.

Discussion

The efficacy for transmission of TTIs through blood is very high. ^[4] Blood donations collected in the window period of infection may be infectious despite a negative antibody test.^[5] The risk of TTIs has declined dramatically in developed nations by the vigorous screening but same cannot be held true for developing countries like India.^[6]

In this study, majority of blood donors were males (97.7 %) which is comparable with other studies in India. ^[2,7-23] This difference was mainly due to high incidence of anemia and underweight in females due to which the

females were mostly deferred from donation. Majority of blood collections were made from voluntary donors (86.7%) by holding about 250 blood donation camps in two years. (Table 1).

Overall the rate of seroprevalence of TTIs in our study was 2.15 % which is comparable with studies by Kaur et al., from North India (2.72 %)^[8]; Pallavi et al (2.22 %)^[11] & Reddy et al. (2.12 %)^[24] from South India; Mandal et al from East India (2.9 %)^[15]; Sastry et al (1.93 %) from West India ^[18] & Yadav et al from Central India (2 %). ^[21] Other studies have reported higher prevalence of TTIs which may be due to higher dependence on replacement donors (RD) and other differences in donor pool and kit sensitivity ^[2,9,22,24].

We observed a higher prevalence of TTI in RDs (2.62 %) as compared to voluntary donors (VD) (2.07 %) (Table 2)and these findings are similar to other Indian studies.^[2, 7, 9, 10, 11, 12, 17, 19, 23] VD are motivated blood donors who donates blood at regular intervals and RD are usually one time blood donors who donates blood only when a relative is in need of blood.^[13] RDs are relatively associated with higher risk of TTIs due to chances of hiding the genuine history.

Higher prevalence of TTIs was noted in males in our study (2.17 %) as compared to female donors (1.06 %) which has also been shown by other studies.^[2,10,14,16,19,21] This could be due to difference in high risk behavioral pattern in males and less blood donation by females. Majority of all TTIs were found to be prevalent in age group of 18-30 years (49.44 %) followed by 31-50 years (47.66 %) . Similar findings have been reported by other studies.^[8,15,20,21] This may be due to high risk of TTIs in sexually active population belonging to 18-50 years of age .

Among all TTIs, HCV contributed highest (1.16 %) followed by HBV (0.78 %), Syphilis (0.124 %), HIV (0.057 %) and Malaria (0.014 %) as shown in figure 1. In our study, highest prevalence of HCV in blood donors among different TTIs is similar to other studies from North India^[7, 8, 9] except Delhi^[10,24] and rest of India^[11-23, 25,26] which showed HBV prevalence as highest.

The prevalence of HCV (1.16 %) from our study is comparable with studies from North India (1.0-1.53 %)^[2,7-9,28] and higher than rest of India (0.43-0.73 %)^[10,24];

South India (0.06-0.51 %)^[11-13, 25], East India (0.35-0.62 %)^[14-16], West India (0.098-0.4 %)^[17-20] , Central India (0.098-0.24 %)^[21-23, 26].

We have observed lower prevalence of HBV (0.78%) than studies from North India (1.03-1.7%)^[2,7-10, 24], South India (0.86-1.28 %)^[11,13,25], East India (1.24-1.75%)^[14,15,16], West India (0.85-1.23 %)^[17-20] ,Central India (0.98-3.15 %)^[21-23, 26]. This might be due to the difference in the study period, donor population and screening methods.

In our study, seroprevalence of HIV among blood donors (0.057%) was reported to be lower than HIV prevalence in Haryana (0.18%) and India (0.22 %) as per NACO 2017 data.^[27] This might be due to stringent donor screening before blood donation, where volunteers who are already HIV reactive didn't turn up for blood donation. Although few studies have reported HIV prevalence comparable with our study ^[12, 20,26].

The prevalence of malaria (0.014 %) in our study was comparable with studies from different zones of India (0.003-0.024 %).^[8, 9, 12, 13, 15, 20, 22, 24, 25] The prevalence of syphilis in our study (0.12 %) was also comparable with other studies.^[8,10-13,15-22]

Conclusion

In the present study, HCV was found to be most prevalent TTI among blood donors. The TTI prevalence of HCV, HBV, HIV, Malaria and Syphilis was reported as 1.16 %, 0.78 %, 0.057 %, 0.014% and 0.124 %. Higher prevalence of TTIs were reported in replacement donors as compared to voluntary donors and in male donors compared to females in our study. The prevalence of TTIs in our study correlate well with prevalence rates from some of the other studies on blood donors in India. Therefore, non-remunerated and repeat voluntary blood donor services are needed and should be encouraged particularly amongst women. Along with use of NAT, confidential donor screening, enhanced public awareness, vigilance of donors, strengthening health facilities can help in decreasing TTIs. A system of regular follow up of positive TTIs donors should be strengthened so that they may be counselled, treated and prevent their re –entry in donor pool.

Table 1. Sex wise distribution of voluntary and replacement donors

	Voluntary donors	Replacement donors	Total donors
Male	17674 (84.5%)	2774 (13.3%)	20448 (97.7%)
Female	462 (2.2%)	08 (0.04%)	470 (2.25 %)
Total	18136 (86.7 %)	2782 (13.29 %)	20918 (100.00%)

Chi-Square=56.083, p-value=.0001**

Table 2. Distribution of different TTIs among male/female donors and voluntary/replacement donors

	Male reactive	Female reactive	z-proportion	p-value	Voluntary reactive	Replacement reactive	z-proportion	p-value	Total reactive	Prevalence
HBV	161	3	.40	.689	142	22	.04	.965	164	0.78 %
HCV	242	02	2.45	.014*	200	44	1.92	.054	244	1.16 %
HIV	12	0	3.47	.001**	9	3	.90	.366	12	0.057 %
Syphilis	26	0	5.10	.0001**	24	2	1.05	.294	26	0.12 %
Malaria	3	0	1.73	.083	1	2	1.30	.194	03	0.014 %
Total	444	5			376	73			449	2.15 %
Prevalence	2.17 %	1.06 %			2.07 %	2.62 %			2.15 %	

Table 3. Age distribution of TTIs.

	18-30yrs	31-50yrs	51-70yrs	Total
HBV	88	73	3	164
HCV	117	119	8	244
HIV	10	2	0	12
Syphilis	6	18	2	26
Malaria	1	2	0	3
Total	222	214	13	449
Prevalence	(49.44 %)	(47.66 %)	(2.89 %)	

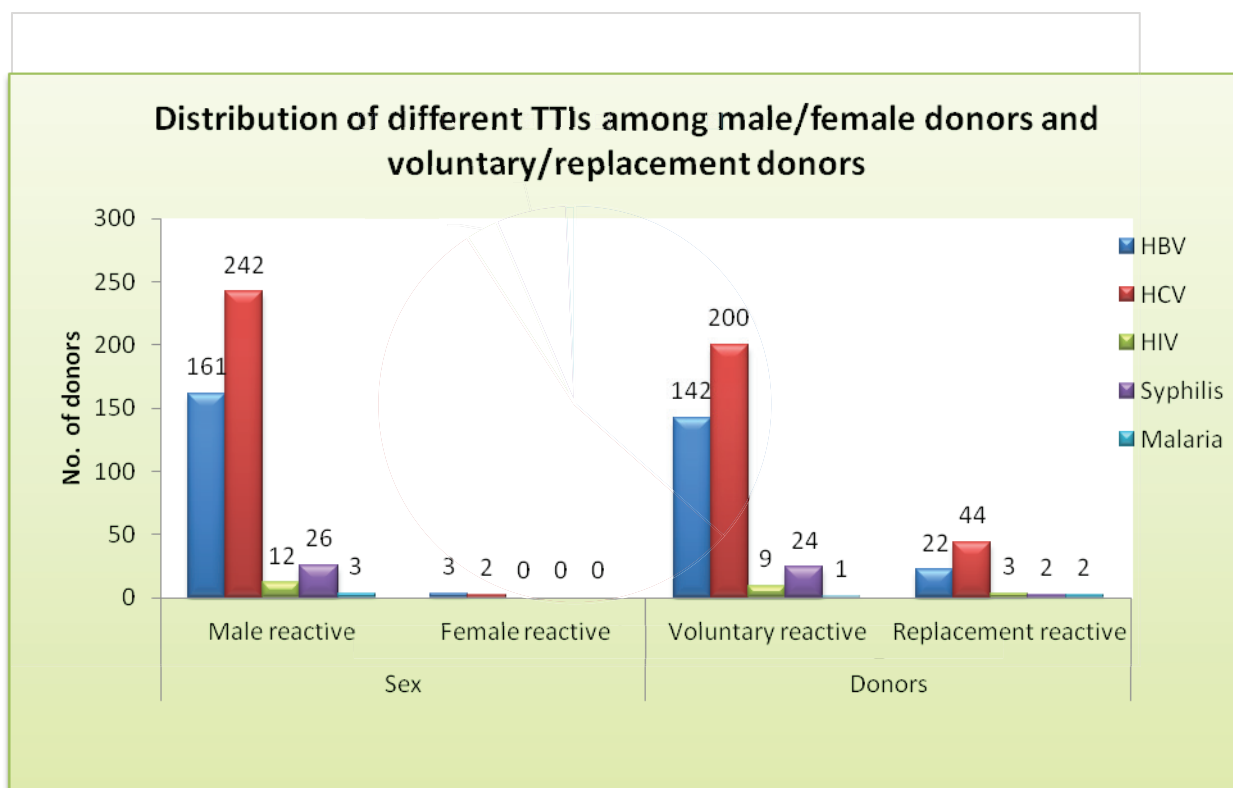


Figure 2: Distribution of TTIs in various categories

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Effect of Pnf Stretching on Proprioception and Physical Function in Individual with Knee Osteoarthritis: An Experimental Study

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Abstract

Background: Osteoarthritis of the knee leads to pain, difficulty in joint, reduced ROM and impaired Proprioceptive accuracy. PNF stretching are used to improve muscle flexibility, pain, ROM. Recently, impaired Proprioceptive accuracy of the knee has been proposed as a local factor in the onset and progression of radiographic knee OA. PNF technique is specifically designed to stimulate mechanoreceptors and Literature show significant effect of static as well as PNF stretching on clinical symptoms of OA knee, but impaired Proprioception is yet not so focused. **Aim:** Aim of the study was to find out the effect of PNF stretching on Proprioception and Physical Function in patients with knee osteoarthritis. **Methodology:** 50 participants were Selected according to selection criteria and randomly divided into PNF and Control Group. in which Outcome Measure for Proprioception by Absolute Angle error with use of universal Goniometer and Physical Function by Gujarati Version of WOMAC(mWOMAC)**Results and Discussion:** The result of the present study shows significant improvement found in the PNF group with p value <0.05 for Proprioception and Physical function. **Conclusion:** Here the study concluded that PNF stretching is statistically and clinically shows significantly effective in Proprioception as well as physical function in OA knee patients. So it can be useful in clinical rehabilitation protocol.

Key Words: Knee Osteoarthritis, Proprioception, Universal Goniometer, PNF Stretching, Static Stretching, Absolute Angle Error, Modified WOMAC Gujarati Version, Joint Position Sense, HR (Hold Relax)

Introduction

Osteoarthritis is one of the most common musculoskeletal disorders; from that knee osteoarthritis is the most common type of arthritis. the overall prevalence of knee OA was found to be (22%–39%) 28.7% in India. Symptoms of osteoarthritis includes pain, tenderness in the knee, stiffness, loss of flexibility, pain in walking, crepitus, grating sensation.¹ Prevalence of OA was found 3.11% in North Gujarat and it affects three times more common in women than men⁹

Degenerative changes may result in imbalance in equilibrium between breakdown and repair process of joint tissue.⁷ Impaired Proprioceptive accuracy of the knee is a local factor in the onset and progression of radiographic knee osteoarthritis. Additionally Proprioceptive impairments could be a cause of knee pain or activity limitations in knee OA patients.^{4,5}

Degenerative changes can affect the function of these proprioceptive accuracy, limb position as well as limb function are compromised¹³ knee OA leads limited range of motion because of pain, damaged articular cartilage, loss of extensibility of capsule and muscle acting over the joint may affect the flexibility of muscle.⁷

Proprioceptive Neuromuscular Facilitation (PNF) stretching technique is utilized to improve muscle elasticity and also shown positive effect on active and

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passive range of motion.² Hamstring and Hip adductor muscle tightness may result in many conditions related to knee.³

Absolute Angle Error assessed by measurement of knee ROM which is assessed by Universal Goniometer. and for assessment of physical function of patient with OA knee assessed by Gujarati version of WOMAC.

Methods

After approval from Institutional Ethical committee and CTRI registration process 50 subjects were selected Based on the inclusion and exclusion criteria. The whole procedure of the study was explained to all the subjects and written informed consent was taken. Prior and after to treatment both the outcome measures, Absolute Angle Error and Gujarati mWOMAC were measured. Intervention in the form of PNF Stretching with Conventional physiotherapy were given alternate 3 sessions per week for 6 weeks.

Materials used in study

- Consent Form
- Assessment Form
- Pen
- Paper
- Universal Goniometer
- Modified Gujarati WOMAC scale,
- Towels
- Short Wave Diathermy

Study Design: An Experimental Study

Study Setting: Sub District Hospital, Mandvi – Kachchh.

Sampling Technique: Purposive Sampling

Study Population: OA Knee Patients

Study Sample: 50

Study Duration: 6 Months

Inclusion Criteria:^(7, 10)

- Patient diagnosed as a case of Primary knee osteoarthritis.
- Radiographic evidence of Grade II or III of Kellgren and Lawrence criteria for knee osteoarthritis.
- Age above 40 - 65 Year.
- Both Gender
- Patients who are able to perform the exercises.
- Patients who are willing to participate in the study

Exclusion Criteria:^(7, 10)

- Subjects with a Secondary osteoarthritis
- Knee pain attributable to a cause other than primary osteoarthritis.
- Pain or any other pathology in the lower back, hips or ankles.
- Any contraindication for exercise.
- Un- co operative patients

Intervention:

Intervention is given to Patient in Form of PNF Stretching for Hip Adductors & Hamstring Muscle for once a day for 3 days a week for 6 weeks to

PNF Stretching for Hip Adductors^{3, 7, 8}: Supine lying Position. The therapist should abduct the subject's leg until a very mild stretching sensation is felt by subject in adductor muscles. Then subject adducts the thigh for 10 sec which is followed by stretching of adductors for 30sec with 30 sec rest in between two sessions.(Figure 1)

PNF Stretching of Hamstring¹⁰: The patient was in the supine position with hip in 90° of flexion. The therapist extends the subject's knee until a very mild stretching sensation is felt by subject in hamstring muscles. The patients do knee flexion for 10 sec against resistance of therapist and then 30 sec stretch by doing knee extension with 30 sec rest in between.(Figure 6)

Conventional therapy

Conventional therapy was given in form of Isometric quadriceps exercises, High sitting knee extension,

Straight leg raise, Hip abduction, hip extension, Along with short-wave diathermy for 10 min, With 10 repetitions for each exercise were given once a day for 5 consecutive days a week for 6 weeks.⁽¹⁾



Result & Statistics

Statistical analysis was done by the Statistical Package for the Social Sciences (IBM SPSS) version21 for windows. Microsoft Word and Excel were used to generate graphs and tables The variables were assessed for Normality of data was checked by using Kolmogorov Smirnov test and Q-Q plot. Mean was calculated as a

measure of central tendency for Absolute Angle Error and Gujarati mWOMAC scale.

Level of significance was kept at $P \leq 0.05$ and confidence interval 95% and Paired t Test is used for Intergroup analysis in both outcome and for intergroup analysis of both outcomes was done by independent sample t test.

TABLE 1: CHANGES IN INTRA GROUP COMPARISION OF MEAN ABSOLUTE ANGLE ERROR IN BOTH GROUP

GROUPS	Pre Treatment		Post Treatment		‘t’ value	‘p’ value
	Mean	±SD	Mean	±SD		
CONTROL GROUP	59.78	10.389	54.38	12.673	3.299	0.003
PNFGROUP	57.64	13.355	47.66	11.272	7.051	0.000

Intergroup comparison of Absolute Angle Error shows a significant difference ($p < 0.05$) in PNF group , It is statistically significant for PNF groups and Only PNF group improved after intervention

TABLE 2: CHANGES IN INTRA GROUP COMPARISION OF MEAN mWOMAC IN BOTH GROUPS

GROUPS	Pre Treatment		Post Treatment		‘t’ value	‘p’ value
	Mean	±SD	Mean	±SD		
CONTROL GROUP	36.36	8.112	35.84	8.00	1.502	0.146
PNF GROUP	40.3	7.0538	37.85	5.77	5.407	.000

mWOMAC shows a significant difference ($p < 0.05$) for Both group so It is statistically significant for both the groups.

TABLE 3: INTER GROUP COMPARISON OF MEAN DIFFERENCE IN ABSOLUTE ANGLE ERROR

Difference in ABSOLUTE ANGLE ERROR	CONTROL GROUP	PNF GROUP	't' value	'p' value
Mean	0.521	2.410	-3.343	0.001
±SD	1.735	2.229		

TABLE 4 SHOWS INTERGROUP ANALYSIS – MEAN OF mWOMAC

	mWOMAC		t value	P value
	CONTROL	PNF		
MEAN	5.398	9.986	-2.120	0.04
SD	8.182	7.080		

Here the alternative hypothesis is accepted which shows the p value 0.04 of mWOMAC shows significant difference and shows improvement in Physical Function of PNF group as compare to control group.

Hence, the result of the present study rejects the Null Hypothesis (H₀) as significant improvement found in the PNF group regarding Proprioception and Physical function

Discussion

The intent of the study was to find out the effectiveness of PNF stretching on Proprioception and Physical Function in Osteoarthritis of knee along with conventional physiotherapy.

the present Study, Result shows improvement in physical function in both the groups. But Proprioception is improved in PNF group only. When compared to control group result shows significant difference in both the outcome in PNF group. This shows improvement in Proprioception and Physical Function in PNF group as compared to control group.

PNF stretching positively affects Proprioception by activation of Golgi tendon organ which inhibits muscle excitement and provides muscle relaxation.

Autogenic inhibition, stress relaxation, muscle tendons and Mechanoreceptors stimulation which is embedded in skin, joint capsule and surrounding connective tissue this all leads to improve in Proprioception.^{2, 3} improved ROM post PNF stretching could be attributed to the mechanism of Sarcomere Give and Autogenic Mechanism. Autogenic Inhibition: During stretching tension develops, Golgi tendon organs fires, afferent stimuli are sent via 2 β fibers, inhibiting α -motor activity and thus decrease tension in the muscle and thus relaxing and lengthening.²²

Proprioception was not improved in control group when applied conventional physiotherapy. It improves flexibility, ROM, reduces tightness of muscles, moves the joint passively as well as actively.² Randomized control trial by Mandeepkaur(2014) shows that static stretching does not improves Proprioception because it causes Plastic stretching which results in irreversible tissue elongation⁷ but in PNF stretching Proprioception Improves because Similar article to this study by Ali Ghanbari (2013) studied and conclude that PNF stretching technique focuses on Active components and it improves in Proprioception by activation of mechanoreceptors and Golgi Tendon Organ.³

Physical function which assessed by Gujarati version of WOMAC in both groups but significant improvement was observed with PNF Stretching. Reason behind that is when PNF stretching is applied it works on mechanism of autogenic inhibition which decreases the neural activity of the stretched muscle so it is more susceptible to stretching by reduction in muscle excitability and that is because of activation of GTO.

PNF stretching improves Physical Function because study by FatihKaya(2018) has review on Positive Effects of Proprioceptive Neuromuscular Facilitation Stretching on Sports Performance and researches reveal that PNF stretching can increase athletic performance in the long-term.²⁰ And also research by Dan Funk et al (2003) reported that PNF stretching improves ROM ^{2,7}and it improves physical performance of patient because. De Deus Gomes et al. (2014)found that PNF Stretching does significant increase in muscle performance.

Conventional physiotherapy also improves physical function by exercises which reduce Pain; increase ROM, active and passive movements ¹.but in comparison with PNF stretching along with conventional physiotherapy shows better improvement because of additional benefits of PNF stretching

PNF Stretching with hold component (hold relax-PNF) is effective because it provides stretch to muscle and at the same time provides isometric resistance to the same muscle which cause neural inhibition and reduces reflex activity and this inhibitory neuron reduces a motor neuron activity which results in muscle relaxation and decreased resistance to stretch and leads to changes in blood flow and increased motor activity affects vascular function .³ the muscle activation release vasoactive substances which results in vascular dilatation.^{3, 7} resultant vascular dilatation wash out the pain producing substances which is reducing pain this findings is according to Ali Ghanbari(2013) who demonstrated significant improvement after implementation of structured stretching Protocol. ^{3,7}

Here in the study PNF Stretching improves both Proprioception and Physical Function in Comparison with Only conventional Physiotherapy because PNF stretching does more amount of active movement in joint. Because Active movement is responsible for improvement in joint Proprioception, Muscle Flexibility,

ROM, muscle strength, Proprioception, activation of GTO, mechanoreceptors, muscle tendon unit activation are improved more significantly with PNF stretching.³

So PNF stretching is beneficial for the rehabilitation protocol of OA knee patients along with conventional physiotherapy for improvement in Proprioception and Physical function in clinical day to day Practice

Further Recommendation

Study can be done with other outcome measurement:

EMG, ROM, MUSCLE STRENGTH

Study can be done with advance strengthening protocol along with PNF stretching

Conclusion

So, Here the study concluded that PNF stretching is statistically and clinically shows significantly effective in Proprioception as well as physical function in OA knee patients. So it can be useful in clinical rehabilitation protocol.

Acknowledgement : -

I owe my gratitude to Dr. Rupesh A. Gor , MS orthopaedic for his continuous support during study and referring patient to me for my study. I would like to thank Dr. Ratan P. Khuman Sir for Giving me a Permission to use Gujarati Version of WOMAC scale for the use as Outcome Measure in my study which he has published.

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Efficacy of Emotional Enhancement Intervention Along with Cognitive Behaviour Techniques for Children with Autism Spectrum Disorder

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Abstract

Background : Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by the prolonged deficits in social emotional reciprocity, repetitive pattern of behaviour, difficulties in communication. Cognitive behaviour interventions (CBI) are found to be effective in restructuring the thought process, providing affective education and teaching cognitive, behavioral skills especially in children diagnosed with ASD. Children with ASD have major difficulties in recognizing and responding to emotional states of others which emphasizes the need and importance of developing a standardized emotional based intervention module.

Methods : Case control experimental method was used in this study. We have categorized 6 children into two group namely control group (3 children) and experimental group (3 children).

To develop the standardized emotional enhancement intervention for individuals with ASD this pilot study module was carried out along with CBI. The study outcome was measured in Pre and Posttest by using Indian assessment scale for autism. Paired sample t test was performed by using SPSS.

Results : The results indicate that the focused intervention enhance the behavioral, cognitive and emotional functioning of children with ASD.

Conclusion : From this study we found that focused intervention can produce significant improvement in the emotional reciprocity of Children with ASD.

Keywords: Autism, Behaviour, Cognitive, Emotional, Intervention, Module

Introduction

Autism is a neuro developmental condition which predominantly affects ones adaptive behaviour, social-emotional and language communication. In the DSM 5 guidelines by American Psychiatric Association (2013),

¹ Autistic disorder, Asperger's disorder, Pervasive developmental disorder have been consolidated into one broader category of autism spectrum disorder to classify more focused treatment methods for the specific impairments identified. Cognitive behaviour therapy is found to be effective in individual with anxiety disorders, ²⁻³ depression and dysthymia, ⁴ bipolar disorder, ⁵ personality disorders, ⁶ substance use disorders ⁷ and also found to be effective for treating maladaptive behaviour and psychological distress. ⁸

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The focused CBI compresses of variety of cognitive, behavioral, and emotion focused techniques and found to be effective in improving adaptive functioning level of individual with autism spectrum disorder.⁹⁻¹² Emotions are predominantly divided into six 'basic' emotions (happy sad, angry, afraid, disgusted and surprised) and numerous 'complex' emotions. Complex emotions involve attribution of the cognitive state where as the basic emotions are universally recognized.¹³ In spite of having difficulties in emotional recognition, the individuals with ASD emotional state can be enhanced by systemization.¹⁴⁻¹⁵ To develop the standardized intervention module that could enhance the basic emotional state of individual with ASD this pilot study was carried out.

Method

Aim :

To find the efficacy of focused cognitive, behavioral and emotional enhancement intervention for children with autism spectrum disorder.

Hypothesis for the study:

H_a There will be a significant improvement in the emotional functioning of children with autism spectrum disorder after the focused intervention.

Study Design : Case control experimental research design was opted for this study

Study Place : National Institute for Empowerment of Persons with Multiple Disabilities (Divyangjan) (NIEPMD), Chennai, India.

Study Duration : 6 sessions over the period of 3 weeks

Inclusion criteria:

§ Age – 4 to 6 years

§ Intelligent quotient – 70 and above

§ The child with minimum level of verbal communication (1 word or 2 words sentence)

§ Child with mild level of Autism spectrum disorder

§ Children with parent / guardian are included

Exclusion criteria:

§ Children in the category of moderate and severe level of autism

§ Children with any co-morbid condition such as Intellectual Disability, ADHD, childhood psychosis, CP etc.

Sampling Technique : Purposive sampling technique.

Sampling Method :

Clients who were coming up for the follow up session in group therapy at NIEPMD were taken in for the study. A group of 6 mothers having children with ASD between the age of 4 to 6 were selected. In the group therapy 3 children (2 male, 1 female) randomly selected for the experimental group and the other 3 children (2 male, 1 female) were considered for the control group. The group therapy involves play activity, singing and dancing that enables the social communication aspect and each children were trained by the mother of another child to develop the social bonding towards others. Out of the 6 children the experimental group (3 children) were selected for the focused intervention in cognitive, behavioral and emotional aspect.

Tool used : Indian Scale for Assessment of Autism (ISAA). Developed by National Institute for Mentally Handicapped (NIMH) (2009) – 40 items. It is rated on a 5-point scale ranging from 1 (never) to 5 (always) and divided under six domains such as (i) Social relationship and reciprocity. (ii) Emotional responsiveness, (iii) speech – Language and Communication, (iv) Behaviour patterns, (v) Sensory aspects, (vi) Cognitive component. The scoring lesser than 70 indicates normal, 70-106 indicates mild autism, 107-153 indicates moderates autism, more than 153 indicates severe autism. The maximum possible score that can be obtain is 200.

Procedure:

The consent for the study was obtained from the mothers of experimental group children. Introductory comment by the researcher about voluntary participation and the right to withdraw from the study were informed. Anonymity and confidentiality were assured. The complete intervention and assessment was carried out

with the support of trained clinical psychology scholar under the supervision of the certified clinical psychology lecturer. The Pre-test was administrated on both control and experimental group of the selected children and the interventions was carried out for the period of 6 sessions (2 sessions in a week) followed by the post test.

Statistical analysis : Descriptive statistics and t test was performed by using the SPSS v25.

Intervention :

The intervention was consist of three major area thus, (i) **Behaviour :** The children sitting tolerance and eye contact was focused. a) **Sitting tolerance :** The children were trained for sitting in one place for longer duration by

the clinical psychologist. b) **Eye contact :** Ball catching method was used by the therapist to improve the focused eye contact of the children. (ii) **Cognitive :** Peg grading board activity was given consistently to improve their cognitive ability functioning (iii) **Emotion :** As emotion has to many complex dimension we had only taken up the core basic emotions such as happy and cry (sad). After the above activity the children were shown with pictures that made up of color in the A4 size showing the images of smiling children (Picture 1) followed by the images of crying children. Then While showing the crying portrait they were trained to understand when significant others, such as a mother or fathter is crying the child should wipe their face.. In this method their hand gesture, vocal communication towards expressing emotions were enhanced.



Picture 1 : Showing the happy and crying images of children which was used for the study.

Then, 3 minutes video of a baby smiling and crying was shown to them by using the laptop computer to stimulate the imitation behaviour in the emotional aspect. After 4 sessions of training, they were made to sit in front of the mirror to express their learned emotion. When prompting in regard to happy or crying the experimental

group children were able to project the same in front of a mirror. Their blend emotions towards these basic emotional aspects were enhanced. Each activity was carried out for 5 to 10 minutes with the assistance of the mother and the therapist. After the completion of 6 sessions the emotional activity was conducted with the

overall group children (Total 6 : Male 4, Female 2) and we found that the experimental group had performed the activity better than the control group because of the focused intervention.

Results

Table 1 : Shows the Pre and Post - test score of ISAA in the control and experimental group children

S.No	Subjects Initial	Control Group		Subjects Initial	Experimental Group	
		Pre Test	Post Test		Pre Test	Post Test
1	RN (Male)	1.97	1.95	AN (Male)	1.87	1.82
2	SK (Male)	2.0	1.97	SA (Female)	1.90	1.85
3	TS (Female)	1.95	1.95	SN (Male)	1.90	1.80

The control group children (2 Male, 1 Female) have undergone the focused cognitive and behaviour based interventions for the period of 3 weeks about 45 minutes in each sessions. The Experimental group children (2 Male, 1 Female) was trained with CBI and emotional enhancement intervention techniques as mentioned in this study.

Table 2 : t test value of control and experimental group children

Paired Sample Test						
		Mean	SD	t	df	P
Control Group						
1	Pre Test	1.97	0.2517	1.04	2	0.17 NS
2	Post Test	1.95	0.1210			
Experimental Group						
1	Pre Test	1.89	0.1732	3.95	2	0.01*
2	Post Test	1.82	0.2517			

NS – Non significant *0.05 significance level

The control group t value was found to be $t=1.04$ which was non-significant whereas experimental group t value was $t=3.95$ and found to be significantly different. Hence hypothesis stating there will be a significant improvement in the emotional functioning of children with autism spectrum disorder after the focused intervention is accepted. Our study findings also confirming the results of Samson, A.C e al 2013, and Lee G T et al 2018. ¹⁶⁻¹⁷

To study the emotional aspect specifically in the children with ASD the following developed questions were also administered in Pre and Post Test. The respective mothers of children with ASD were the participant of the following questionnaire.

Emotional enhancement checklist :

- The child is comprehending the happy and sad

emotion Yes / Moderately / No

· The child is expressing the happy and sad emotion Yes / Moderately / No

· The child can manage/control the exaggerated

emotion Yes / Moderately / No

The scoring was formulated by 3 point rating scale namely (i) Yes indicates - 3, (ii) Moderately indicates - 2 and (iii) No indicates - 1. Maximum possible score is 9.

Table 3 : Shows the Pre and Post - test raw score of Emotional enhancement check list (Short version)

S.No	Subject's Initial	Pre-Test	Post Test
1	AN (Male)	4	7
2	SA (Female)	3	5
3	SN (Male)	4	8

Table 4 : Shows the Mean , SD and t value of the experimental group (N - 3) in Emotional enhancement check list :

		Mean	SD	t	df	P
1	Pre Test	3.66	0.577	3.95	2	0.01*
2	Post Test	6.66	0.14			

P<0.05 * t value is significant at 0.05 level

From the table 4 we could empirically inferred that the focused emotional intervention will enhance the emotional regulation of children with ASD. It also confirmed by the study of Vahabzadeh, A et 2018. ¹⁸

Discussion

CBI programs use a combination of approaches to increase a learner’s awareness of self and others. This can sometimes be coupled with the teaching of social skills to assist the learner with interpersonal skills and may incorporate other evidence-based practices. In other words, these specific types of intervention programs provide psychoeducation and assist a learner in restructuring the thought process, providing affective education, and teaching cognitive and behavioral skills to assist in basic decision-making, problem solving and coping. ¹⁹ The attempt we tried to represent

in this study was that the blend emotion can be enhanced by the focused emotional enhancement intervention technique also we emphasize the need and importance of developing a standardized intervention module for treating emotional regulation in individual with ASD.

Conclusion

The intensive focused intervention can produce significant improvement in the behavioral, cognitive and emotional functioning of individual with ASD. The pilot study module of emotional enhancement intervention produce a significant improvement in the emotional state of children with ASD.

Limitations and Future Directions :

The childhood period is very crucial for one’s development hence the module and the method we

implemented is most suitable for the age group for 4 to 8. Children below the age of 4 and above the age of 8 may need modified intervention technique. Early diagnosis and intervention methods are much effective in children with ASD.

Implications :

The instruments and techniques we used is easily accessible by the lower family economic background people who have children with ASD. After obtaining the proper technique from the therapist the child's parents can implement the same in the home environmental set up for the effective and comprehensive care.

Acknowledgment : The corresponding author would like to express the sincere gratitude to the Department of Clinical Psychology, National Institute for Empowerment of Persons with Multiple Disabilities (Divyangjan) for their constant support and cooperation throughout the study.

Declarations :

Funding : No funding sources

Conflict of Interest : None declared

Ethical approval : The study was approved by the Institutional Ethics Committee

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Experiencing Foster Care-Happiness and Wellbeing of Institutionalised Children

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Abstract

The institutionalised children are the most vulnerable group in our society and they show many problems. To improve institutionalized children's protection there is an urgent need to understand the various issues faced by them and find out remedial measures. To ensure the care and protection of institutionalised children, the Kerala state government has launched foster care scheme under the department of women and child development. This study is based on the group discussion by researcher with the institutionalised children who are experiencing foster care.

The objective of the study is to understand the foster care experience of institutionalised children and also understand their happiness and wellbeing during the period of foster caring. The researcher selected focus group discussion method for collecting data. Researcher made two focus group discussion with institutionalised children who are experiencing foster care. The group include six girls and another group contain seven boys. Hence the total respondents were thirteen in number

Result and Conclusion: The experience of foster care children from foster families are very positive. They are satisfied with the care, love and facilities which are provided by their foster parents and siblings. The children can transform their lives during the foster care period. Many children have the wish to return their foster family.

Keywords: Experience, foster care, happiness, wellbeing, institutionalised children.

Introduction

Children's home is an institution established for the protection, education, training and rehabilitation of children in need of care and protection as defined in section 2(D) of the Juvenile Justice Act 2015. These institutions are the home to the children who are in need of care and protection. The children from socially, economically and educationally backward family in our society, homeless children, children released from child labour, street children, children whom were saved by child line are in need of care and protection. The institutionalised children's admission is permitted by the order of the Child welfare committee. These children are most marginalized and vulnerable group in our society. Adequate support and care is an essential component for emotional, mental and physical wellbeing of institutionalised children. During vacation

period an alternate care provided for the wellbeing of children. These alternate care is provided in India as per the guidelines of Ministry of women and child development. It is carried out by District child protection unit and the foster care children were placed for foster care by the individual case assessment of child welfare committee.

Foster care is the alternate care for children in need of care and protection in the family environment other than the child's biological family. Care giver of foster family is referred as foster parent and they are approved by the state government under the guidelines of foster care system. Foster parents has been selected by child welfare committee. Family has vital role in the behavior modification of children. It is important for the overall development of children. The National Policy for children 2013 said that all children have right to grow

in a family atmosphere which provide love, warmth, care, happiness and understanding¹.

Fostering is a temporary residential care system for institutionalised children. They live with unrelated or extended family. In this System their biological parents do not lose their parental rights. Foster care is the placement of child till he or she is able to return to their own family. The maximum duration of foster care is one year². Foster care can provide more opportunity and a better quality of life.

The children who are placed in a foster home shows transformation in their lives. This transformation happens not only in children but also in foster parents. Becoming a foster parent is rewarding and it is a calling for the majority of carers more than a job. Obviously there are lows and highs, but the positive side of both partners overcome the negatives ones³.

Foster care provides stability and secure environment, Academic stability, family life and strong family contact to the children. Children under foster care intervention had higher level of wellbeing, Attention and positive effect when compared to children who remain in institution⁴. Children's future wellbeing only happen within a family environment which provides care, love and affection, happiness. Lack of care caused many behavioural problem in children. The institutional children shows growth suppression, impairment in psychological, emotional and social development when compared to non institutionalized children. The children who are experiencing the foster care can recover from these developmental impairments. A well designed foster care programme can make high quality improvement in institutionalised children⁵.

Foster care may be short term or long term depending upon the needs of the child. The duration of the foster care has been based on the individual case assessment by child welfare committee. Based on the individual care plan, institutionalized children in the age group of six to eighteen years shall be placed in foster care. The age group zero to six years will not be considered for placement. They should be considered for permanent adoption. According to the report of U S Department of Health and Human service children's beauro, In 2015 22 percent of total foster care children were adopted by their foster parents. The parents who are terminally

ill couldn't take their children. In this situation also the children should be provided foster care with their permission of their biological parents⁶.

In 2018, there are approximately 140 couples and in 2019 approximately 200 couples in Kerala were approved as foster parents by District child protection unit and child welfare committee. The children who are wishing to foster family are sent to different families under the guidelines of Juvenile Justice Act 2015. Foster care can be two month summer vacation programme. But the child and foster parents are interested to extend the period of staying, the child welfare committee will give permission to extend the duration. Wellbeing is not the state of merely the absence of diseases and also an individual can lead his life with satisfaction. Wellbeing is associated with an individual's physical health, mental health and resilience, that is the ability to cope with unfamiliar situations. The pleasurable and enjoying moments directly leads to the transformation of institutionalised children. The psycho social intervention method has great influence in the behavioural change of children. Hence the foster care programme helps the wellbeing of children in need of care and protection.

Methodology

This study was conducted in two children's home under the department of women and child development of Kerala government. One children's home was for boys and another children's home was for Girls. In this qualitative study, focus group discussion was used for understanding the experience of foster care among institutionalized children. Two focus group discussions were held. One group include six girls and another group contain seven boys. Thus the total number of respondents were thirteen in number. The collected opinion from all respondents are reviewed for this study.

From the words of Sukanya (name changed for privacy) thirteen year old girl, researcher understood that she enjoyed the vacation with caring parents and siblings. She experienced the love and warmth of the family during the two month vacation period. Sukanya said that she did not feel loneliness and she got brother and sister from there. "when Mom and Pappa went for outings and family functions they protected and loved me as their own child" she said. Foster family provide warmth and moments of enjoyment to foster care children. Because

of their love and affection many children told that they wished to go their foster family again.

Akash (name changed for privacy) eight year old boy said that Mom and Pappa gave him gifts, new school bag, chapel and dresses. And also they provide enjoying moments during beach trip. "I got a loving elder sister" he said. Appukuttan, (Name changed for privacy) five year old boy came to the orphanage 1 year back and his father was a drug addict. Mother abandoned him. The boy was very happy to be with a family. He said, "I like the new house and the new parents promised that they will take me if I study well". The boy was studying well as he wants to go from children home to the family. "I got new shirt and shoes. My father gave me chappals". The boy was curious of the things given by the new family. He was in a wonder world seeing all the new facilities and comfort which he never got from his biological parents. Because of the strong bond between the foster care and foster child, some times they couldn't be separated. The memories of the happy moments make them feel to go back to their foster families. In this situation foster care period may be extended. Foster family also provide academic stability.

Lakshmi (name changed) 12 year old girl was sent to teacher's family who have no children, She liked the place very much and her only concern is that there is no one to play with. She liked the puppy and pussy cat in that home and said. "Teacher dad and Teacher mom got a new pet, and that is me". Lakshmi is very much attached to the teacher couple and wish to stay back as she has not experienced a familial atmosphere. Lakshmi is a born orphan and she was raised in an orphanage later she was handed over to the children's home. Lakshmi for the first time in her life came to know what is a "home" and how she would be feeling good and comfort if she had a family.

Selva Kumar (name changed, 14 yrs) is a boy from Tamil Nadu who came with his uncle and aunt for coolie works. His biological parents are alcohol addicted and uncle took him with him for manual labour. The child line people saw the boy and was given to the orphanage. "I want to go with a Tamil family. I like Tamil food. The new Malayalee parents are good, but I want Tamil People". Selva Kumar said. The children home people have promised him to find a Tamil family during

the next time. Selva Kumar felt this is a fresh experience where he was fully mingled with a Malayalee family consisting of father, mother and two children. There were also grand parents who were strict and asked him to take bath twice a day and also to do prayers in the morning and evening. Keeping this aside Selva Kumar is so happy to have a big house and family and to travel in a car like other children. Foster parents ensured care and security to the children.

Rani (name changed, 6 yrs) is the charming beauty of the children's home. She went with a family having three male children. The parents were longing for a female child and happened to see Rani and they sent their readiness to accept Rani as their foster child, Rani is still in the wonder world. She always wears the dress given by the new parents. From the words of Rani "I got three new friends to play with and the elder brother take me outside in the car". Rani is so excited to be in the family and she wished to get more brothers like these. "I like the two new brothers, so that I don't want to do any work". Foster care helped the institutionalised children to become have a sense of belonging and the feeling of loneliness cleared up in their mind. They experienced the pleasing moments, individual care and learned moral values from their foster family.

Rahman (name changed) fourteen year old boy wished to drive cars and bikes and his dream was fulfilled when his new parents taught him the basic lessons of driving "I want to be eighteen years very soon so that I can get license and my new parents will give me the car". Now they allowed him to take the car in the courtyard only. "I will study very well and will buy a Benz very soon. I want to take my new parents for a ride". He said this innocent words. Rahman was sent with a family who don't have a family who don't have male children. They only had a daughter and she is married and settled in America. They wished to have a child in their home and so they happily agreed to take Rahman with them. Rahman is always explaining how he was treated by the new parents and all other friends wished to see his new parents. He also bought sweets and gifts for his orphanage friends. These parents visit Rahman and also they often call him. They have also promised a trip soon. Through the focus group discussion many of the children told that they want to go back to their foster family again. From their words researcher understood

that the foster care provide the children physical, social, emotional and psychological wellbeing. The foster parents and siblings lives in the heart of the children who were taken into foster family. Every pleasurable moments were in their mind. "I got a good family, next time I wish to go another family, because I want to experience the happiest moments of various families". Neenu, eight year old girl said.

Findings

Foster care is provided to the children who are of the age group between six to eighteen. During these period all children pass through some maladjustment and difficulties. Children's emotional, physical and mental difficulties may clear up completely only with an adequate support system. From the stand point of the child's physical, psychological and social wellbeing proper supportive relationships and environments are very important. Reviewing all cases in this study researcher understood that all children who are experiencing foster care got an opportunity to spend happiest moments with good family. These children got these effective parental care because of the screening of foster family by child welfare committee. When the screening is not carried out, it will negatively affect the children's mental health and overall well being. Only when foster parents do their responsibility in effective manner, the children are satisfied to stay with them

The adequate support of childhood has great influence in the wellbeing and health of a person. Children's wellbeing is related with the environment which they live in. The social relationships are also of great importance in the holistic wellbeing of children. The parental care and housing conditions have the vital role in the development of children.

Foster care programme help the homeless children to get housing, emotional support, and to acquire life skills. Every child deserve a chance at belonging, safety, happiness and love. Children who are the victim of natural disasters, substance use, trafficked children from economically and socially backward family, street children etc belongs under the umbrella of children in need of care and protection. Providing residential care system such as foster care is a great exposure to the holistic development of these children. It also provide happy moments to foster parents. Through foster care

the children got safe, happy, comfortable and healthy atmosphere. The foster parents ensures the safe and comfortable zone to foster children. Thus the level of happiness and wellbeing was higher in foster care children during their fostering period. Many of the children had a desire to return back to foster family rather than their biological family. "I can't leave my mother and father, even if my biological mother come back to me, I like to stay with them one more year" Sithara (name changed for privacy) said. From her words researcher realized that the warmth, love and affection of foster parents leads the children to become more happy. Foster family gifted the new clothes, school materials, books and bags to the academic year for children. It gives a lot of pleasure to children and they acquire academic stability. During the conversation with the district child protection officer the researcher reached at the conclusion that there is no bad experience faced by foster children with their foster parents because the DCPCU placed the children only after the detailed enquiry about foster family.

Through these vacation family, children learn the moral values, sense of belonging and they have an opportunity to know more about how a family function, how to behave while interacting with others and adjust with unfamiliar situations. The warmth of the family provide them all these qualities. In Kerala foster care system is known as "sanadha bhalyam". Sandha bhalyam is very fruitful programme for the happiness and wellbeing of institutionalised children.

Discussion and Conclusion

Childhood experience is the root of the future health and wellbeing of a person. Institutionalised children face lot of problems. One of the intervention programme is Foster care system. Through foster care children got shelter, clothing and adequate food. Foster care parents provided warmth, love and affection, support, care and gave opportunities for child's over all physical, emotional and mental health development. They ensure vocational training and education based on the interests of the child. Foster family protected the children from abuse, maltreatment and exploitation. They also provide treatment in emergency situation. Foster care system in Kerala had a great impact on the development of foster children as well as foster parents. Both parties got a lot of pleasure and enjoyment.

Ethical Clearance- Taken from Human Ethics Committee, Dept. of Social Work, Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India

Source of Funding- Self

Conflict of Interest- Nil

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Physical Activity Level among School Going Children in Surat City, Gujarat: A Cross Sectional Survey

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Abstract

Background: Physical inactivity in children and adolescents is a major issue in public health. Physical activity (PA) is a best predictor of cardiovascular, skeletal, and mental health in children and adolescents, yet contemporary youth, and especially girls, are often insufficiently active. However, PA levels in children of Surat city, Gujarat has been less explored. So present study was undertaken. **Methodology:** A Cross-sectional survey was conducted on 82 children from 3 different schools of Surat city using self-reported PAQ-C (Physical Activity Questionnaire -Children) in last seven days to measure PA after obtaining permission from school authorities. Anthropometric measures and self-reported socio-demographic data were also recorded. Descriptive statistics were used to depict the characteristics of the study population and PA levels. **Results:** Mean PA level amongst children was 2.55 (SD=0.60). PA level in girls (2.24, SD=0.73) was significantly lower than in males (2.67, SD=0.67), ($p<0.05$). 82% (n=66) of students fell in low PA group (PA score <3). PA declined with increasing age ($r=-0.17$, $p<0.05$). **Conclusion:** Inadequate PA was reported among children. The present study even suggested that children should be engaged in more amount of PA which will help in reducing the health risks.

Key words: Physical activity, PAQ-C, School children

Introduction

Childhood and adolescence are precious periods of life due to tremendous changes in various physiological and psychological aspects, and also due to healthy/unhealthy lifestyle and behaviours are formed during this time.¹ Sedentary life style is a seriously growing health problem.² An inactive lifestyle during childhood places children at greater risk of becoming obese and developing cardiovascular disease in adulthood.³

Physical activity (PA) is an important component of a healthy lifestyle in the today's modern world.⁴ Number of chronic diseases could be prevented or minimized if

the proper amount of PA was reached.⁵ PA by world health organization (WHO) is defined as any bodily movements produced by skeletal muscles that requires energy expenditure.⁶

According to National guidelines of India (2010) , recommended PA for children is daily participation in 60 minutes or more PA, most of which should be moderate to vigorous intensity.⁷ WHO recommendation for children of all ages is requirement of vigorous PA 3 times a week for 60 minutes.⁸ PA levels in children and adults have traditionally been measured by questionnaires, with attending advantages and limitations.⁹ Evidence-based research indicate that PA reduces adiposity in both overweight and normal children, improves musculo-skeletal and cardiovascular health and fitness, positively influences concentration and memory and thereby on intellectual performance.^{10,11}

A systematic review of literature conducted by Janssen and LeBlanc¹⁰ regarding the health benefits

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of PA in school-aged children and identified several key health benefits associated with increased PA like decreased cholesterol, decreased depression, increased bone density, decreased obesity, decreased blood pressure, decreased injury and metabolic syndrome.

Role of school is very important as a key setting for the promotion of PA to young people. Though school provides an important context for promoting PA in children, physical education class may provide only a limited contribution to National PA recommendation.¹² PA level in children is reduced because of change in lifestyle like watching television, playing games on computer or mobile for long hours, change in eating habits and various other reasons. Children usually do not compensate for PA after school and PA opportunities are restricted during the school day so additional school based programme other than physical education classes are needed.

Therefore understanding the interplay of children's levels of PA is important. Literature showed decline in PA levels in children and adolescent.^{8,13-15} There were few attempts to measure PA in children and adolescents across different regions of India with varied tools.¹⁶⁻²⁰ The PA levels in children of Gujarat have not been adequately studied. Identifying patterns of PA behaviour in children population will help to improve interventions to become and stay active into adolescent and adulthood. So the study was conducted to assess the current status of PA in children of Surat city, Gujarat.

Methodology

Before commencement of the study, the study was approved by the institutional ethical committee of SPB physiotherapy college, with Reg. no. EC/SPB/011. The study is registered under the clinical trial registry of India with registration no. CTRI/2018/12/016800. A comprehensive description of the nature, purpose and procedure of the study was explained to the school authorities in their vernacular language. After obtaining permission from school authorities, a cross sectional survey conducted on a school going children (n=82) aged between 11-14 years (girls and boys) from the three different Gujarati medium school (GBSE) of Surat city, Gujarat. Children who were not willing to participate, with any history of / diagnosed case of- Diabetes, acute or chronic respiratory disorder, cardio-vascular

disorder, neurophysiological disorder, musculoskeletal disorder, any other known medical/systemic condition, on any regular medication, absent on day of survey and the one diagnosed with any physical problem in annual physical examination conducted by school authorities were excluded. After that assent form from children and consent form from parents/guardians eligible children were obtained. From the eligible children and their parents/guardian, necessary information for demographic data were recorded and the anthropometric measurements were taken and BMI (Body mass index) was calculated as weight (kg) divided by height (m) squared.

PA measurement:

PA was measured with the use of PAQ-C Gujarati version (PAQ-C G)). The PAQ-C (G) includes nine items, each scored on a 5-point scale. The last question asks students about their health. This question was not used to score the PA level but used to present reasons for not participating in PA. Composite score of nine items was taken and PA of each participant was rated by taking mean of those nine items' score which would range from one to five with a higher value indicative of a higher activity level.

Face content validity and test retest reliability of PAQ-C (G) were established before the commencement of the present study. PAQ-C (G) has good face-content validity and reliability (intra-class correlation coefficient (ICC) for total score of PAQ-C (G): 0.82, for the individual items ICC ranged from 0.78 to 0.91 and $\alpha = 0.94$ and $\alpha = 0.92$ for assessments one and two (one week apart).²¹

Purpose and procedure of study along with necessary instructions to fill up PAQ-C (G) were explained to the children and all of the questions were read out loud and any questions if they had were answered. 15 to 20 minutes were given to fill up the questionnaire in the classroom. Score ≥ 3 was classified to be active while score < 3 was classified as sedentary.²²

Results

Data analysis was done using SPSS version 20. Descriptive statistics were used to depict the characteristics of the study population and PA levels.

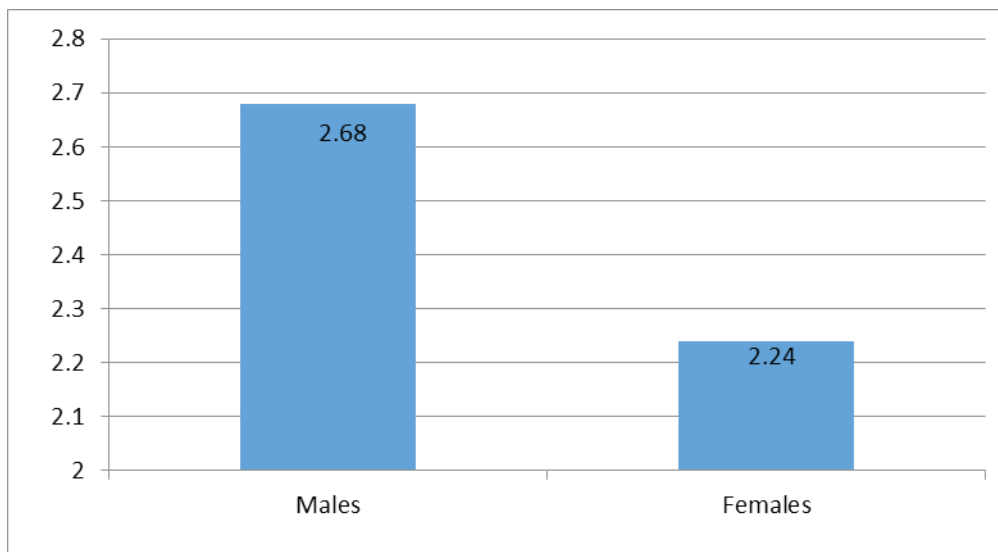
PA Level (Graph I and Graph II)

Mean \pm SD PA score for children was 2.55 ± 0.60 . PA score of girls (2.24 ± 0.73) was significantly lower than males (2.67 ± 0.67), ($p < 0.05$). 82% of students fell in low PA group (PA score < 3). Most PA was bicycling ($n=49$) and Tag/chain ($n=65$) among children. PA common level of students in physical education (PE) classes influences their overall PA level and it showed

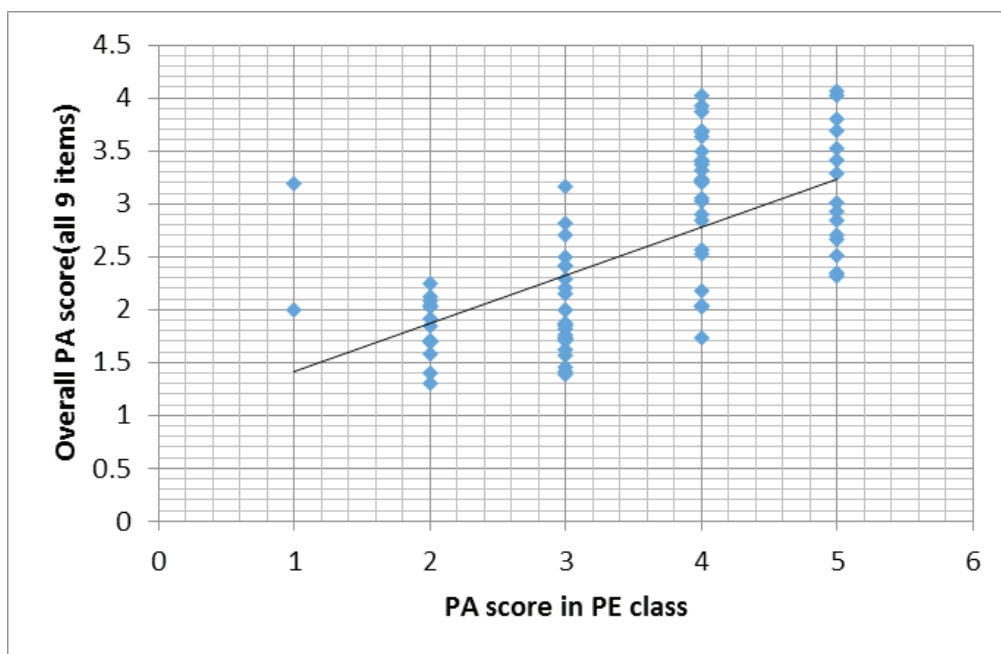
a Spearman's correlation coefficient of $0.67 (p < 0.0001)$ for all the students. PA level for weekends (Saturday, Sunday) 3.23 ± 1.26 was significantly higher than weekdays (Monday-Friday) 2.66 ± 1.01 ($p < 0.05$).

Correlation of PA Levels with Age (Graph III)

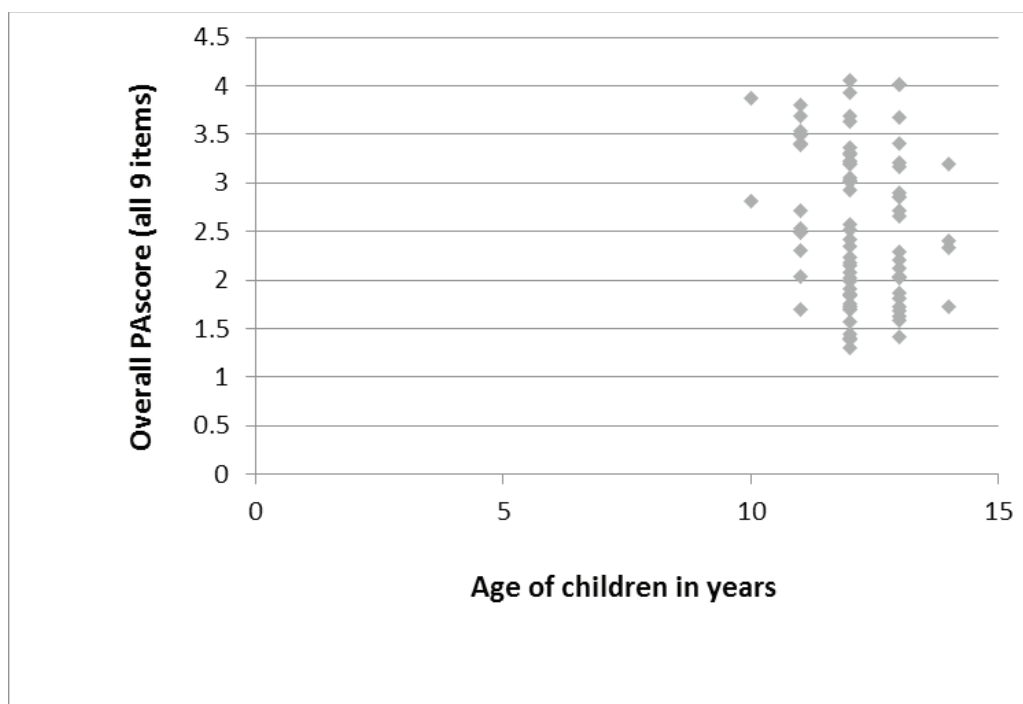
PA declined with increasing age with Spearman's correlation coefficient of $-0.17, p < 0.05$.



Graph I: Gender wise mean score of PAQ-C among children



Graph II: Correlation of PA score in PE class with overall PA level



Graph III: Correlation of PA with Age among all the students (n=82)

Discussion

Results of the present study showed low PA among school children. Mean \pm SD score of PA was 2.55 ± 0.60 for PAQ-C and 82% of children fall in low PA group. These findings are in consistent with previous studies.^{8,13,23,24}

A study done by Rashmi Ronghe et al¹⁴ and Hemal Dave et al¹³ used a PAQ-C to measure PA and rest of studies used a different methodology to find out a PA but showed a similar findings of decline in PA among school children. A longitudinal study done by Philip R. Nader²³ et al on 1032 participants from age 9 to 14 years using accelerometer and found a significant decrease in PA over a time with boys found to be more active compared to girls. In African setting, Similar study done²⁴ on 172 children/adolescents from Morocco using accelerometer to measure PA and suggested that children and adolescents spent more time in sedentary activity during weekdays versus weekends with amount of time spent in moderate to vigorous physical activity (MVPA) was higher among boys than girls. 38.8% of the children and adolescents met the recommendation of ≥ 60 (min/day) of MVPA.

Available Indian research supports the finding of the present study. In Anand, A study¹³ using PAQ-C to measure PA on school children(10-19 years, n=3337),concluded inadequate PA among school children with significantly higher PA in males as compared to females .A study conducted by Rashmi Ronghe et al¹⁴ in Nagpur suggested that more children should be engaged in PA which will help in reducing the health risks. Achal Gulati et al⁸ conducted study among the 1,680 children(3-11 years) from different cities of India and found that 21 % of the children were inactive, 18 % exercised at least 1 time per week and 21 % between 2 and 3 times weekly. Significant difference was noted for the prevalence of physical inactivity by town ,with highest percentages in Chennai (29 %) and lowest in Hyderabad (4%).

The result of the present study (mean score of PAQ-C 2.55) was not consistent with the reported PA of other countries. Mean score of PAQ-C was 3.16, 3.36, 3.37, 3.19, 3.49, 3.36 and 2.62 for the Turkish²⁵, European and African American²⁶, Hispanic²⁶, British²⁷ and Chinese²⁸ children respectively. More practice of the sports culture, knowledge and awareness for importance of PA among the parents and believing in overall growth of child rather than only academic growth were the

probable factors for the result leads to higher level of PA among the children other than India.

In line with the present study, several other studies^{8,13,14,23,24} have also found less PA among girls compared to males. The probable reasons for this finding were due to the weakest participation of girls in organized sport. School environment, more preference of girls for indoor games and television viewing, social stigma of female sports activities, Biological reasons, availability and accessibility of playgrounds to especially for the girls along with self-perception of girls of feeling less compatible to PA as compared to male may also contribute to these differences.¹³ Puberty at earlier age also makes females physically less active due to social inhibition in Indian culture.

Significantly lower level of PA over weekdays versus weekends in the present study may indicate that the children are more engaged with burden of school work (project work), tuition work, homework, exam preparations during weekdays as compare to weekends. New school policies should be developed for preserving their time for the PA to prevent decline in PA among the youth. Role of PE class for improving overall PA level among school children needs to be explored. PA during PE class should be modified such that each student spends minimum 50% of the time in moderate to vigorous PA.¹³

Motivation of the parents to engage their child in vigorous level of PA to reduce the health risk is also an important factor to increase the PA level among school children.

Decline in PA as the age increases in the present study ($r = -0.17$) is consistent with previous studies.^{13,18,19,23-25} Probable reason for this result is school work load increases as children advances to next standard, academic stress, children may introduce themselves in other things which take their time away from PA.¹³

However, Accuracy of self-report questionnaire by children could be a limiting factor for present study.

Conclusion

The present study concluded that inadequate PA was noted among children. Only 18% of the children were identified as active individuals. Creating awareness and

benefits regarding PA should be increased in children, parents and in their schools. Increase in duration of the PE class in the school, engaging children in one of the PA at least 3 times per week and encouraging girl child to participate in sports should be emphasized to reduce the health risks.

Funding: Self

Conflict of Interest: None

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Adherence to Medication among the Patients with Type 2 Diabetes Mellitus in a Rural Area: A Community based Study

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Abstract

Introduction: Adherence to anti-diabetic drugs as shown to improve the glycemetic control which then predicts the good long term prognosis and prevents the complications of the Diabetes.

Objectives: 1. To assess the Adherence to medication among the Type 2 Diabetic patients 2. To determine the factors associated with the Adherence to Medication

Materials & Method: A Community based cross sectional study was conducted for a period of 6 months among type 2 diabetic patients in a rural area. A Non probability sample (convenience sample) of the 70 Type 2 Diabetes Mellitus patients was selected for the study. Adherence to medication was assessed using eight item Moriskey Medication Adherence Scale (MMAS - 8). The patients were also investigated for the random blood sugar (RBS) using Glucometer

Results: Adherence to medication based on the MMAS – 8 scale, 56 patients (80%) had a good adherence & 14 patients (20%) showed poor adherence. Regarding the Random blood sugar (RBS) levels, 54 (77%) patients had uncontrolled RBS levels. The difference in the Adherence level between the Age, Gender, Duration of Diabetes, Literacy Status & RBS values of the patients was not statistically significant.

Conclusion: Even though majority of the patients had good Adherence to their medications (80%), their Random blood sugar levels showed uncontrolled values (>200mg/dl) Therefore along with adherence to medication emphasis should be given on the other aspects like Diet, mental health & social life of the Diabetic patients.

Keywords: Type 2 Diabetes Mellitus. Random blood sugar. Adherence to medication

Introduction

Diabetes is a chronic metabolic non-communicable disease that has attained epidemic proportions worldwide. It is characterized by chronic hyperglycemia along with disturbances of carbohydrate, lipid and protein metabolism. [1]

As of 2015, 415 million adults are having diabetes and this number is estimated to increase to 642 million by 2040 worldwide. India is one of the epicenters of global diabetes epidemic and has the second highest number of people with the diabetes in the world with 69.2 million individuals as of 2015 and this number will increase to 123.5 million by 2040. [1,2]

It has been shown that good glycemetic control helps to prevent the complications of diabetes like retinopathy, neuropathy, nephropathy and associated cardiovascular diseases. [3,4] One of the important factor for good glycemetic control is strict adherence to the anti-diabetics drugs.

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Adherence is an active, voluntary and collaborative involvement of the patient in a mutually acceptable course of behavior to produce a therapeutic results. [3,5] Adherence to the anti-diabetic drugs as shown to improve the glycemic control which then predicts the good long term prognosis and prevents the complications of the Diabetes. [6] Along with adherence to medication, diabetes can be managed by self-care practices which includes diet, exercise, blood glucose monitoring, foot care, with regular follow up with the health care providers. [7] The reports of World Health Organization have emphasized that “increasing the effectiveness of drug adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments”. [8] Along with the pharmacological approach, the patient’s perception also will play a key role in every day decisions regarding dietary choices, physical activity & adherence to drug prescriptions. [9]

Objectives

1. To assess the Adherence to medication among the Type 2 Diabetic patients
2. To determine the factors associated with the Adherence to Medication

Materials and Method

A community based cross sectional study was conducted for a period of 6 months among type 2 diabetic patients in Kakaramanahalli, a Village in the rural field practice area of Rajarajeswari Medical College & Hospital, Bangalore, Karnataka. Based on the primary data available in the rural health centre, there were 70 registered diabetic patients in Kakaramanahalli. A Non probability sample (convenience sample) of these 70 patients was selected for the study. Type 2 diabetic patients under anti diabetic medication for at least 6 months were included & interviewed. The study excluded the individuals who refused to give informed consent, Type 1 diabetics & those not willing for blood glucose measurement.

A home visit was given to all the registered diabetic patients. If they were not found, revisit was given to that particular house. After taking the informed consent, interview was conducted using predesigned semi structured questionnaire. Contents of the questionnaire were explained to the patients and they were ensured that a total confidentiality was maintained. The questionnaire included information regarding socio-demographic factors, basic information about their diabetes mellitus & adherence to the anti - diabetic medications. Adherence to medication was assessed using eight item Morisky Medication Adherence Scale (MMAS - 8). Response categories were yes/no for each item with a dichotomous response and a 5-point Likert response for the last item. Poor adherence or low adherence to medication was considered as Score of < 6 & good adherence for a score of ≥ 6 . [10]

The patients were investigated for the Random Blood Sugar (RBS) using Glucometer, a RBS value of > 200 mg/dl was considered as uncontrolled diabetic.

Statistical Analysis

Data was entered in MS excel and presented in percentages, proportion, mean & standard deviation. Chi square test was used as a test of significance to determine the factors associated with the adherence to medication. P Value of < 0.05 was considered as statistical significance

Results

Out of the 70 patients, 28 (40%) were males & 42 (60%) were females. The mean age of the patients was 58.94 ± 14.54 years with majority 49 (70%) being above 50 years of age. Majority of the patients accounting for 60 (80%) were married. More than half of the patients 40 (57%) were illiterates. With respect to the occupation, 26 (37%) patients were semi-professionals. Majority belonged to three-generation family 31 (44%) followed with nuclear family 29 (42%).

Table 1: Distribution of the patients based on their Basic Diabetes Mellitus details**Table 1: Distribution of the patients based on their Basic Diabetes Mellitus details**

Characteristic	Category	Frequency (n= 70)	Percentage
Family History of Diabetes	Yes	21	30
	No	45	64
	Don't Know	04	06
Duration of Diabetes	6 months – 2 years	15	22
	2 years – 5 years	17	24
	5 years – 10 years	29	41
	Above 10 years	09	13
Circumstances under which Diabetes was Diagnosed	As a part of Routine Check up	07	10
	when consulted for other diseases	28	40
	when consulted doctor for fatigue, poor wound healing, polyphagia, polyuria, polydipsia	35	50
Treatment	Oral hypoglycemic drugs	67	96
	Oral hypoglycemic drugs & Insulin	03	04
Health Sector for Treatment	Private	45	64
	Government	25	36

Family history of diabetes was present among 21 (30%) patients. The mean duration of diabetes mellitus among the patients was 6.47 ± 4.55 years with most of the patients having diabetes between 5 years to 10 years of duration accounting for 29 (41%). Half of the patients, 35 (50%) got diagnosed for diabetes when they consulted

a doctor for symptoms of diabetes (fatigue, poor wound healing, polyphagia, polyuria and polydipsia). Majority of the patients 67 (96%) were taking oral hypoglycemic drugs for treatment of diabetes & 45 patients (64%) choose private health care center for treatment.

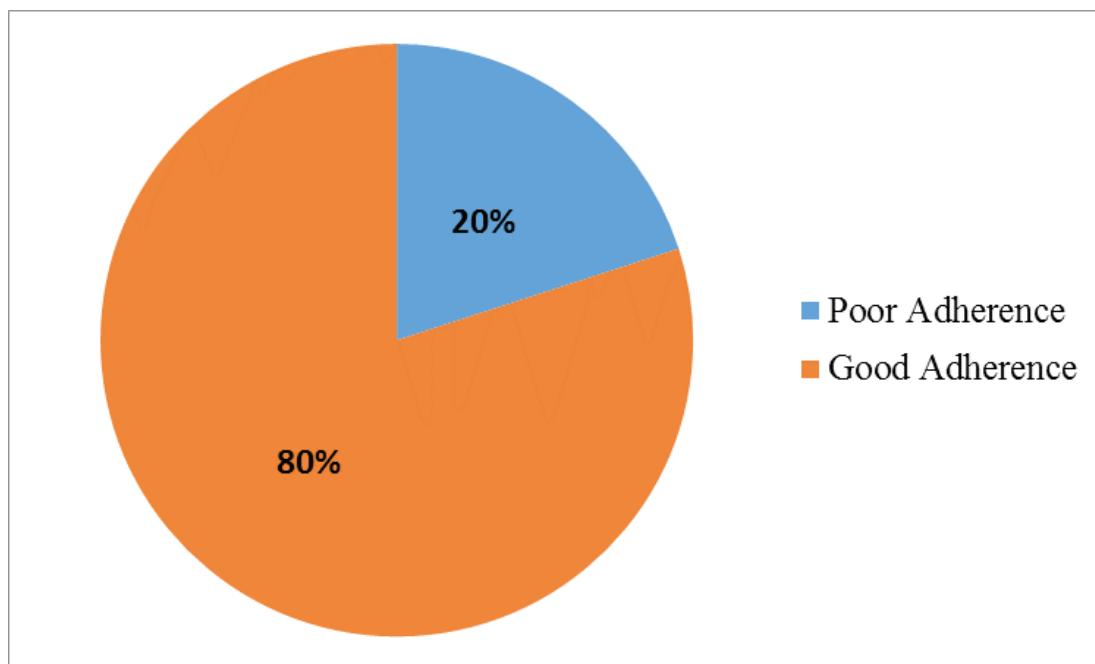


Figure 1: Percentage wise distribution of Diabetic patients according to their Level of Adherence to Medication

In the present study, 56 patients (80%) had a good adherence & 14 patients (20%) showed poor adherence to the medication.

Table 2: Distribution of the Diabetic patients based on their Random Blood sugar (RBS) levels & Body Mass Index (BMI)

Characteristic	Category	Frequency	Percent
RBS	Below 200	16	23
	200 – 300	31	44
	300 - 400	17	24
	Above 400	06	09

Regarding the Random blood sugar (RBS) levels, 54 (77%) patients had uncontrolled RBS levels & 16 patients (23%) had Normal RBS levels. Among the patients with uncontrolled RBS levels, 31 patients (44%) had RBS levels between 200 to 300 mg/dl, 17 patients (24%) between 300 - 400 mg/dl & 06 patients (09%) RBS levels were above 400mg/dl.

Table 3: Responses of the patients for individual questions of MMAS - 8

Questions	Yes Frequency (%)	No Frequency (%)
Do you sometimes forget to take your Diabetes medication? *	14 (20)	56 (80)
In the last two weeks, was there any day when you did not take your Diabetes medication? *	13(19)	57 (81)
Have you ever stopped taking your medications or decreased the dose without first warning your doctor because you felt worse when you took them? *	8 (11)	62 (89)
When you travel or leave the house, do you sometimes forget to take your medications? *	36 (51)	34 (49)
Did you take your Diabetes medication yesterday? *	64 (91)	6 (9)
When you feel your Diabetes is controlled, do you sometimes stop taking your medications? *	5 (7)	65 (93)
Have you ever felt distressed for strictly following your Diabetes Mellitus treatment? *	8 (11)	62 (89)
How often do you have difficulty to remember taking all your Diabetes Mellitus medications? a. Never b. Almost Never c. Sometimes d. Frequently e. Always	40 (57) 20 (29) 9 (13) - 1 (1)	

*to be read row-wise

Responses of the patients on individual questions were analyzed, 14 patients (20%) answered that they tend to forget to take their medicines, 13 patients (19%) had problems in taking their medicines in last 2 weeks, 8 patients (11%) had either stopped taking their medicines or decreased the dose without informing their doctor, 36 patients (51%) stated that they forget to take their

medicines along with them during travelling, only 5 patients (7%) stated that they stop their medicines when they feel their blood sugar level is under control, 8 patients (11%) stated that they feel inconvenience and difficulty in adhering to the medication plan. Majority of the patients never had difficulty to remember taking all the Diabetes Mellitus medications accounting for 40 patients (57%).

Table 4: Association between the Level of Adherence & certain characteristics of Diabetes Mellitus Patients

Categorization	Adherence Score		Total (N = 70)	P value
	Poor Adherence (n = 14)	Good Adherence (n = 56)		
Age (in years)				
50 & below	3 (21)	18 (32)	21	0.529
Above 50	11(79)	38 (68)	49	
Gender				
Male	6 (43)	22 (39)	28	0.807
Female	8 (57)	34 (61)	42	
Education Status				
Illiterate	8(57)	32 (57)	40	1.000
Literate	6(43)	24(43)	30	
Duration of Diabetes				
5 years & below	7 (50)	25(45)	32	0.719
Above 5 years	7(50)	31(55)	38	
Health Sector				
Private	8 (57)	37 (66)	45	0.533
Government	6(43)	19(34)	25	
Random Blood Sugar (RBS)				
< 200	1(7)	15 (27)	16	0.164
>200	13 (93)	41(73)	54	

*to be read Column wise

Among the patients with poor adherence (14), majorities were above 50 years of age 11(79%), females 08 (57%), Illiterates 08 (57%) & Patients taking treatment from private health sector 08 (57%). Almost all the poorly adherent patients, 13 (93%) were having abnormal RBS levels. The difference in the Adherence level between the Age, Gender, Duration of Diabetes, Literacy Status & RBS values of the patients was not statistically significant.

Discussion

In the present study, regarding the Adherence to medication, 56 patients (80%) had a good adherence & 14 patients (20%) showed poor adherence. The findings similar to the present study were in several studies, a hospital study from Puducherry reported that 26% of their study population had a low adherence score. [11] A hospital study from Mangalore showed that low adherence was found in 28% of the study participants:

[12] A study from a diabetic clinic of Ethiopia showed that the proportion of patients with a low adherence score was 25.4%. [13] But in a study done by Khotkar et.al (2017) in a Tertiary care Hospital, Navi Mumbai [3] found only 1% had high medication adherence while 34% had moderate & 65% had low medication adherence. The reason for the high prevalence of low adherence to medication in their study would be the gender where 65% of the patients were males but in the present study males accounted for 40%. In a community based study conducted by Murugan Venkateshan, Amol R.Dongre and Kalaiselvan Ganapathy in Tamil Nadu Rural area, [8] the prevalence of low adherence for treatment was 45.4% whereas in the present study it is 20%. The difference would be majority of the patients in their study approached government sector for treatment (66%) whereas in the present study majority approached private sector (64%). In a study conducted by Jackson et.al in Nigeria (2014), [14] 50.2% of the Type 2 Diabetic

patients were low adherers, the reason for the high magnitude of low adherence might be the geographical area

Regarding the responses of the patients to individual items of MMAS- 8, a community based study done by Sankar UV et.al (2013) in rural Kerala^[10] found that 79% patients sometimes stopped taking medications when they felt that their health condition is under control & in a study done by Khotkar et.al (2017)^[3], 61% patients reported the same whereas in the present study it was reported only in the 7% of the patients. Sankar UV et.al (2013)^[10] stated 63% patients felt inconvenience in taking medications every day & in Khotkar et.al (2017)^[3] study 69% patients reported the same but in the present study it was only 11% of the patients. The reason for the difference would be due to geographical area, doctor patient relationship & also the quality time spent with the doctor will have a role in determining the attitude of the patient.

Sankar UV et.al (2013)^[10] study showed, 56% patients reduced the dose or stopped taking medications without telling the doctor because they felt worse when they took the medicine which is comparable with the present study where 51% patients reported the same whereas study done by Khotkar et.al (2017)^[3] reported that 83% forgot to take medicines when away from home and/or travelling, the reason might be the stressful urban life in Navi mumbai. In the present study when test of significance was applied to certain variables, none of the variables had a statistically significant association with the adherence score whereas in a study conducted by Jackson et.al in Nigeria (2014)^[14] showed low adherence to medication had statistically significant association with low literacy level.

Limitations:

The sample size of the study is limited. As the sampling method is convenience sampling technique the findings cannot be generalized to the community.

Conclusion

Even though majority of the patients had good Adherence to their medications (80%), their Random blood sugar levels showed uncontrolled values (>200mg/dl) Therefore along with adherence to medication

emphasis should be given on the other aspects like Diet, mental health & social life of the Diabetic patients.

Conflict of Interest: None declared

Source of Funding: Nil

Ethical Clearance: Obtained from the Institutional Ethical Committee, RajaRajeswari Medical College & Hospital, Bangalore

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Risk of Dementia among the Elderly in a Rural Community: A Cross Sectional Study

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Abstract

Introduction: India is one of the countries in demographic transition where the elderly population is increasing. Dementia affects memory, thinking, behavior and ability to perform daily activities. It has physical, psychological, social and economic impact not only on people with dementia but also on their care givers and family members. Awareness must be raised to reinforce dementia as a public health priority.

Objectives: 1.To assess the risk of dementia among Geriatric people using Picture Memory Impaired Screening (PMIS) tool 2. To determine the factors associated with the risk of dementia.

Methods: A community based cross sectional study with study duration of 8 months among the geriatric people living in a rural area. A Non Probability Sampling was done and 87 elderly were subjected to picture memory impaired screening (PMIS) test which is a screening tool validated for use in a low education population to identify individuals at risk of dementia.

Results: Elderly at risk of Dementia accounted for 22%. There was no statistically significant association between dementia and age, gender, marital status & occupation.

Conclusions: The present study shows that elderly people living in rural area are facing risk of Dementia. The PMIS Tool is simple and easy to administer. So, the health staff working in the rural area can be trained in using PMIS Tool.

Keywords: Dementia, Picture memory impairment screen, Elderly, Rural area

Introduction

Awareness about the mental health problems of the elderly among the people remains low. [1] As per the population census 2011, elderly people (aged 60 years & above) living in India are nearly 104 million. This shows the elderly population is increasing over time, from 5.6% in 1961 to 8.6% in 2011. The report from United Nations Population Fund & Helpage India suggests that the number of elderly population is expected to grow to 173

million by 2026. Majority of elderly population of about 71% are residing in rural area & 29% in the urban areas. [2] Dementia is emerging as a public health problem & it is a major cause of disability & mortality among the elderly. [3] Due to the demographic transition taking place in India, the number of people living with dementia is expected to increase [4]. WHO says "Dementia is a syndrome, usually of a chronic or progressive nature, in which there is deterioration in memory, thinking, behavior & ability to perform everyday activities". [5] According to a study in India, 90% of the dementia cases remain unidentified. [6] In India, the difference between number of people with the condition who need care & the number of people who receive care (treatment gap) for dementia is about 90%. [7] Although dementia is seen in older people, it is not a normal part of aging. [5] People

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are not differentiating normal aging & phenomena that are secondary to conditions such as dementia. Generally dementia is still considered culturally unacceptable & usually is not identified as a health condition. [1]

Mini Mental State Examination (MMSE) is the best known standard screening method among many of the physicians but they consider it as too long & too difficult to interpret. [8] On the other hand Picture Memory Impaired Screening (PMIS) tool is a quick & reliable screening method for dementia that can be used in older adults with little or no education. Especially among the elderly with low education, PMIS has better specificity than the MMSE. As the majority of the elderly are living in the rural areas, PMIS tool would be beneficial. Hence the present study was taken up in a rural area with the following objectives

Objectives

1. To assess the risk of dementia among elderly using Picture Memory Impaired Screening (PMIS) tool
2. To determine the factors associated with the risk of dementia.

Materials and Method

A Community based cross sectional study was conducted for a period of 8 months in the year 2018 among the elderly residing in Kakaramanahalli, a village in the rural field practice area of Rajarajeswari Medical College & Hospital, Bangalore. A non-probability sampling technique (Purposive sampling) was used. A total of 87 elderly participated in the study. A pre – designed Picture Memory Impaired Screening (PMIS) tool was used to screen for the risk of Dementia [3]. Katz activity of daily living scale was used as an interference tool. It is commonly referred as Katz ADL scale which is used to assess the functional status based

on the ability of the elderly to perform activities of the daily living (bathing, dressing, toileting, transferring, continence, and feeding). [9] Individuals aged 60 years or above residing in Kakaramanahalli were included & interviewed. The study excluded the individuals who did not give consent to the study & those with hearing and visual impairment

Methodology

House to house survey was conducted in the study area & elderly were interviewed after obtaining the informed consent. All the elderly in the house were subjected to Picture Memory Impaired Screening (PMIS), which is a four minute long procedure where they are made to recognize 4 images from different categories learned by identifying each item when its category cue is presented i.e participants were asked to name each item (e.g apple) when the investigator said its category cue (e.g fruit). Interviewer explained the study tool in local language (kannada). Once they identified the images an interference task was given by using katz activity of daily living scale lasting for 2 minutes and then the participant was asked to recall the images that were shown in any order. If they were unable to recall, the category cue was presented. Two points were given if the images were recalled without cue and one point was given if it was recalled after the cue. Total score of 8, if the score is ≤ 5 then the memory of the participant was considered as impaired [6,10]

Statistical Analysis

Data was entered in excel and analysed using Statistical package SPSS version 20. Results were tabulated in percentages and proportions. Chi square test was applied to test the statistical significance. P value of < 0.05 was considered to be statistically significant

Results

Table 1: socio demographic profile of the study participants (N = 87)

Characteristic	Category	Frequency	Percentage
Age	60 - 69	46	53
	70 - 79	30	34
	80 and above	11	13

Cont... Table 1: socio demographic profile of the study participants (N = 87)

Gender	Male	29	33
	Female	58	67
Marital Status	Married	51	59
	Unmarried	03	3
	Widow/Widower	33	38
Educational Status	Illiterate	82	94
	Literate	05	06
Occupation	Agriculturist	34	39
	Currently not working	53	61

Out of the 87 elderly, majority were in the age group of 60 – 69 years (young old) accounting for 46 (53%). Females outnumbered the males, 58(67%) were females and 29 (33%) were males. Regarding the Marital status, 51 (59%) elderly were married, 33 (38%) of the elderly were either widow or widower and 03 (3%) remained unmarried. Illiteracy among the elderly was found to be on the higher side accounting for 82 (94%). Majority of the elderly were currently not working (61%).

Table 2: Association of the Socio – demographic factors with the risk of dementia

Characteristic	classification	Dementia			P Value
		Risk of dementia (n= 19) Frequency(%)	No Dementia (n= 68) Frequency (%)	Total N (87)	
Age (in years)	60 - 69	7 (15.2)	39 (84.8)	46(100)	0.22
	70 - 79	8 (26.6)	22 (73.4)	30(100)	
	80 and above	4 (36.4)	7 (63.6)	11(100)	
Gender	Male	7 (24.1)	22 (75.9)	29(100)	0.92
	Female	12 (20.7)	46 (79.3)	58(100)	
Marital status	married	9 (17.6)	42 (82.4)	51(100)	0.260
	Widow/widower	10(27.3)	26 (72.7)	36(100)	
occupation	Agriculturist	05 (14.7)	29 (85.3)	34(100)	0.19
	Currently not working	14 (26.4)	39(73.6)	53(100)	

*To be read row wise

Total number of elderly at risk of dementia accounted for 19 (22%). The mean scores in PMIS screening was 6.47 ± 1.69 . Katz activity of daily living was used as an interference tool to assess the functional

status of the elderly which showed all the elderly to have full functioning capacity. The risk of dementia found was more among elderly aged 80 years & above (36.4%) followed by 70 – 79 years (26.6%). Males were

at more risk of dementia accounting for 24.1%. Married elderly were at a lesser risk for dementia (17.6%) compared to Widow/widower (27.3). Elderly those currently not working were found to be at more risk of dementia accounting for 26.4. There was no statistically significant association between dementia and any of the socio demographic factors.

Discussion

The elderly population is increasing over a period of time & majorities are living in the rural area. So emphasis should be on the rural elderly population. More studies are needed to address dementia among rural elderly. In the present study the mean age of the elderly was 68.6 ± 6.36 years with majority being in the age group of 60 – 69 years (53%) & females formed the major group with 67%. Similar findings were seen in a study conducted in an urban underprivileged area, Bangalore by Mathew G et al (2018) [10] where 75.74% were in the age group of 60–70 years with a mean age of 68.01 years (SD 8.18 years) & 69.8% were females. In the study by Mathew G et al majority of the elderly, 56% were widows or widowers, 65% elderly were illiterates & 83% of the elderly were currently not working but in the present study majority were married (59%) , 94% of the elderly were illiterates & 59% were current not working. Illiteracy was high in the present study may be as the elderly were from rural area.

By using PMIS screening tool to detect the risk of dementia, the present study found the risk of dementia among the elderly to be 22%. The finding of the present study was comparable with a hospital based study by Joe Varghese et al [6] in Kerala for the validation of PMIS which showed a prevalence of 21.3% among the elderly in 2010.

In a study conducted in an urban underprivileged area, Bangalore by Mathew G et al (2018) [10] using PMIS the prevalence of dementia among the elderly was 15.3%. In an epidemiological study of dementia done by Shaji S using Mini Mental Status Examination (MMSE) Scale in a rural community in Kerala, India (1996) [11] found the prevalence rate of 33.9 per thousand and another study done by Mummadi MK using MMSE scale in the old age homes of Hyderabad (2013) [12] the prevalence of dementia was 8%. In a study by Poddar K et al in Uttar Pradesh (2011) [13] prevalence of dementia

was 5.1%. Studies by Mathew G et al (2018) [10], Joe Varghese et al [6] & the present study showed magnitude of dementia between 15.3% to 22% where PMIS tool was used to screen dementia whereas in the studies by Shaji S (1996) [11], Mummadi MK (2013) [12] & Poddar K et al (2011) [13] prevalence was between 3.39% & 8% where MMSE scale was used to screen dementia. The variation in the studies may be due to the use of different screening tools.

Findings of the present study when compared to the study by Mathew G et al conducted in a urban underprivileged area, Bangalore (2018) [10] where same screening tool was used to screen dementia (PMIS) were as follows, in the present study the risk of dementia found was more among elderly aged 80 years & above 36.4% & similarly in their study majority for the risk of dementia were in the age group of above 80 years accounting for 61.5%. In the present study males were at more risk of dementia accounting for 24.1% whereas in their study it was females who were at more risk accounting for 17%. In the present study there was no statistically significant association between dementia and any of the socio demographic factors but in their study statistically significant association was found between the age & dementia & there was no statistically significant association between gender & dementia.

Findings of the present study when compared to the study by Poddar K et al conducted in Uttar Pradesh (2011) [13] where unlike to present study MMSE screening tool was used to screen dementia were as follows, in their study prevalence of dementia was more among elderly aged 80 years & above (15%), similarly in the present study dementia was more among elderly aged 80 years & above (36.4). In the present study, dementia was more among males (24.1%) but in their study dementia was more among females (7.2%). In the present study married elderly were at a lesser risk for dementia (17.6%) compared to Widow/widower (27.3) & similarly in their study dementia was more among widow/widower (9.3) when compared to married elderly (4.3). In the present study there was no statistically significant association between dementia and any of the socio demographic factors but in their study statistically significant association was found between the age, gender & marital status. The sample size of their study was quiet high (2890) when compared to the present

study (87), this might be the reason for the statistically significant association in their study.

In a study Mummadi MK in 2013 [12] statistically significant association was found between dementia with age, occupation but with gender there was no statistically significant association whereas in the present study there was no statistically significant association between dementia and any of the socio demographic factors.

In the present study all the elderly showed to have full functioning capacity which was assessed using Katz activity of daily living scale but over the course of the disease all the areas of daily living might get affected among the elderly who are at risk of dementia [14]

Limitations:

The sample size of the study is limited. As the sampling method is purposive sampling technique, the findings cannot be generalized to the community.

Conclusion

PMIS is validated for use in a low education population, majority of the elderly in the study were illiterates and currently not working. The present study shows that elderly people living in rural area are facing risk of dementia. There was no statistically significant association between risk of dementia and Socio-demographic factors. The PMIS tool is simple and easy to administer. So, the health staff working under primary health center in the rural area can be trained in using PMIS Tool & it can also be used as a screening tool for elderly in the outpatient department.

Acknowledgement: Authors are thankful to Mrs Jayamma, field worker in Kakaramanahalli rural health center for her kind Assistance

Conflict of Interest: None declared

Source of Funding: Nil

Ethical Clearance: Obtained from the Institutional Ethical Committee, RajaRajeswari Medical College & Hospital, Bangalore

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Prevalence & Pattern of Tobacco Use among Adolescents in Vijayapura City, Karnataka – A Cross Sectional Study

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Abstract

Introduction: Tobacco contains the alkaloid nicotine, which is a stimulant, and harmful alkaloids & has addictive properties. Adolescent age group is the period of transition from childhood to adulthood and the habits that usually start in this age group will remain throughout life. GATS-2 highlights, 19% of men, 2% of women and 10.7% of all adults currently smoke tobacco. 29.6% of men, 12.8% of women and 21.4% of all adults currently use smokeless tobacco. **Objectives:** To find the Prevalence & Pattern of Tobacco use among adolescents in Vijayapura city. **Method:** A cross-sectional study was conducted in Vijayapura city, which is the headquarter of Vijayapura district of Karnataka state, for 3 months among adolescents(10-19yrs) by using structured proforma, containing socio-demographic profile, details & pattern of tobacco use, money spent on tobacco products & knowledge of side-effects of tobacco use. **Results:** Among 432 adolescents interviewed, 28% were found using tobacco (smokeless> smoking), Male >females, Literates >illiterates, students >working group. The average money spent on tobacco was Rs.14 for smoking form & Rs.12 for smokeless form of tobacco. Tobacco use was started at the age of 14years. Parental influence to start the use of tobacco by adolescents was observed. **Conclusions-** The prevalence of tobacco use found among adolescent is around one third of the overall. The young Indians have lot of addictions and distractions, which include tobacco as one of it. It is very necessary to control the tobacco habit & protect the adolescents against the health hazards of tobacco.

Keywords: Adolescent, Nicotine, pattern of tobacco, oral cancers.

Introduction

The epidemic of tobacco use is one of the greatest threats to global health today. It is one of the preventable causes of disease and disability around the world. According to estimates made by the World Health Organization (WHO), currently about 5 million people die prematurely every year in the world due to the use of tobacco and by 2030, it would double to 10 million deaths every year, with about 7 million of the deaths taking place in developing countries. India will have the fastest rate of rise in deaths attributable to tobacco and many of these will occur in the productive years of adult life, as a consequence of an addiction acquired in youth.¹

The tobacco plant, Nicotiana, has probably been responsible for more deaths than any other herb. At present, tobacco smoking is causing over 3 million

deaths a year worldwide, and if current smoking trends continue the annual mortality will exceed 10 million by around 2030.² Add to this the mortality from cancers caused by oral uses and the death toll becomes still higher.³

Adolescents, in today's world, are increasingly exposed to changing lifestyles that have very negative impact on health. Addictions developed in adolescence are likely to persist into adult life. One such addiction being tobacco use among children and adolescents is reaching at its pandemic levels. The World Bank has reported that between 82,000--99,000 children and adolescents all over the world begin smoking every day. About half of them will continue to smoke into adulthood and half of the adult smokers are expected to die prematurely due to smoking related diseases. If

current smoking trends continue, tobacco will kill nearly 250 million of today's children.⁴

The tobacco situation in India is unique because of a vast spectrum of tobacco products available for smoking as well as smokeless use. The risks of tobacco use are highest among those who start early and continue its use for a long period.⁵ The early age of initiation underscores the urgent need to intervene and protect this vulnerable group from falling prey to this addiction. The most common reasons cited for children to start using tobacco are peer pressure, parental tobacco habits, and pocket money given to children.⁶ It is seen that smoking and drinking become symbols of maturity and independence, among the young people. For them, the use of tobacco provides an opportunity for taking part in a behavior that defies established social norms.⁷

With this background a survey was planned to find the Prevalence & Pattern of Tobacco use among adolescent age group in urban area.

Methodology

A prospective cross sectional study was planned to achieve the desired objectives by using structured interview method. The study was conducted in Vijayapura city, which is the district headquarter of Vijayapura district of Karnataka state of India. Study period was total two months (Feb-March 2019), during which preparation for the study was done initially followed by training of Medico-social workers. Study units were residents of Vijayapura city in the adolescent age group (10 to 19yrs)⁸.

With 95% confidence level and margin of error of $\pm 5\%$, a sample size of 384 subjects will allow

the study to determine the Prevalence n pattern of tobacco use in Vijayapur city. Adjusting for 5% drop out rate, recruitment target will be set at 405 subjects. By using the formula: $n = z^2p(1-p) / d^2$. Where, $z = z$ statistic at 5% level of significance, d is margin of error, p is anticipated prevalence rate (50%)the survey was conducted in Vijayapura city, which contains six Government Urban Health Centers. The sample size of 408 was divided in six UHC of the city and that comes around 68 adolescents in each area of UHCs.

Those who are falling in the prescribed age group were enrolled in the study by using Simple random technique and they were interviewed by the trained team members after taking informed consent & by using the proforma, which contains socio-demographic profile, details of tobacco use, pattern of tobacco use by them, amount spent on purchase of tobacco products & knowledge of side effects of tobacco use. The city was divided in to six areas, which were covered by six different Urban Health Training centers.

All characteristics were summarized descriptively. For continuous variables, the summary statistics of N , mean, standard deviation (SD) was used. For categorical data, the number and percentage was used in the data summaries and data was analyzed by Chi square test for association and diagrammatic presentation.

Results

Total 432 people in the age group of 11 to 19 yrs were participated in the study from throughout the Vijayapura city after giving informed consent. Nearly equal proportions of participants were included in the study from all the six areas of the Vijayapura city (Fig. 1).

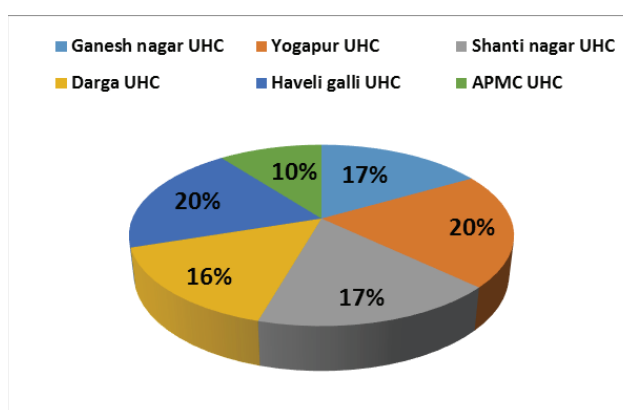


Figure No 1: Frequency distribution of Participants Based on Six UHC Areas

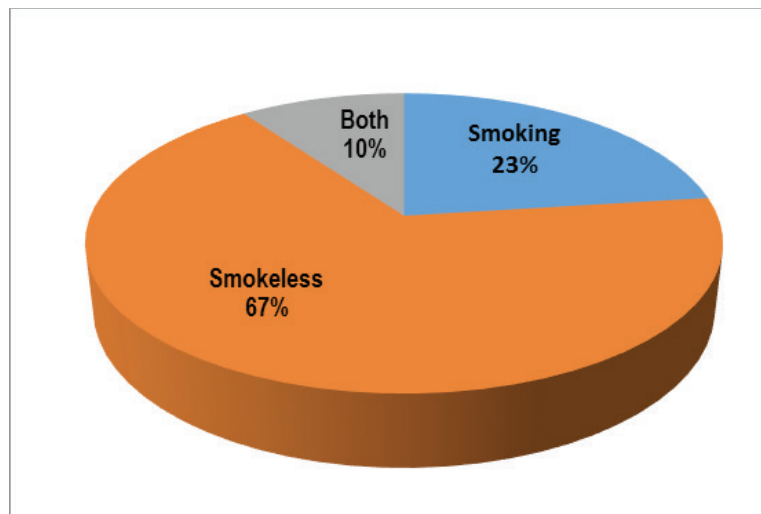


Figure II – Prevalence & Pattern Of Tobacco Use In Vijayapura City

Out of 432 interviewed for tobacco use during the study around 123 (28.4%) were found using one or other forms of tobacco currently. The prevalence of tobacco use in Vijayapura city among adolescents was 28.4%. Around 67% of tobacco users found using various forms of smokeless form of tobacco followed by smoking form (23%). About 10% of tobacco users were using both form of tobacco currently (fig.2).

Table No.1: Age Wise Distribution of Tobacco Users

Parameters	Currently Using Tobacco		Type					
			Both type		Smokeless		Smoking	
	N	%	N	%	N	%	N	%
AGE (YRS)	< 18	31.7%	31.7%	01	8.3%	27	32.5%	11
	≥ 18 – 19	68.3%	68.3%	11	91.7%	56	67.5%	17

Majority of tobacco users were having age more than 18 years whereas 31.7% were under the age group of 18 years i.e. in the Minor age group that means they have access to tobacco purchase probably easily. In both age groups smokeless form was found more commonly than smoking form (Table.2).

About 92% of tobacco users were male whereas females using tobacco was found only 8%. All the females were using smokeless form of tobacco and not the smoking may be because of traditional values not support smoking by female in India. Among males smokeless form (73%) is found more commonly than smoking form (28%).

Majority of tobacco users were having education level of higher secondary (56.9%) followed by secondary level education (30%) & graduation level (8.9%). Only 1.6% of tobacco users were Illiterate, which signifies there is no relation between education level and tobacco use by adolescent age groups in present century.

Table No 2: Occupation Wise Distribution of Pattern of Tobacco use

Currently Using Tobacco	Type					
	Both		Smokeless		Smoking	
N =123	%	N	%	N	%	N
Labour	20	16.3%	06	50.0%	13	15.7%
Skilled/ Semi-Skilled Workers	40	32.5%	01	8.3%	31	37.3%
Student	62	50.4%	04	33.3%	39	47.0%
Unemployed	01	0.8%	01	8.3%	00	0.0%

Majority of tobacco users were students (50%) i.e. engaged in one or other grades of education followed by those who were working (skilled/semi skilled work – 32.5%). Tobacco use was seen in labours (16.3%) & unemployed (0.8%) was very less compared to students (Table.2).

Table No 3: Details of Tobacco Use Among Tobacco Users

Parameters		Male		Female		$(\chi^2 \text{ test})$ p value
		Mean	SD	Mean	SD	
Smoking	Duration (years)	02	0.5	-	-	-
	Money Spent On It per Day	14.1	13.1	-	-	-
Smokeless	Duration (years)	04	01	01	0.5	0.004*
	Money Spent on it per day	12.8	05	09	04	0.003*
Tobacco Use Was Started First Time At The Age of		14.6	04	06	4.1	0.003*

Note: * significant at 5% level of significance ($p < 0.05$)

Mean duration of tobacco use among male users was around 2 months in smoking and 4 months in smokeless form. The average money spent by the users of tobacco was Rs. 14 for smoking form & Rs. 12 for smokeless

form of tobacco. Tobacco use was started at the age of 14 years on an average among users of tobacco, which is very early phase of adolescence.

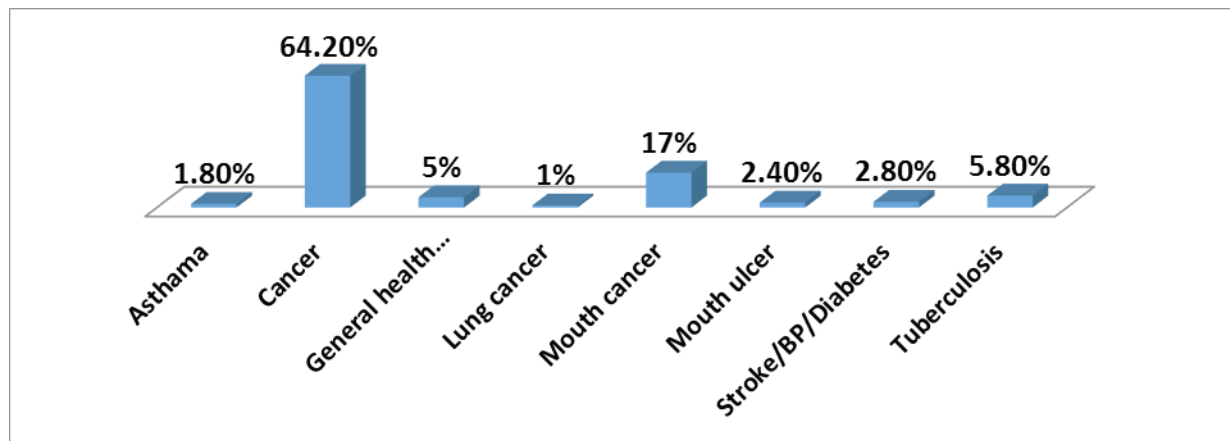


Figure 3: Type of Side Effects Mentioned by the Study Participants

Discussion

This study reports prevalence of tobacco use among the adolescents of Vijayapura city is 28%. The proportion of smokeless tobacco (67%) use is more compared to smoking (23%) and both (10%) form of tobacco among adolescents. The proportion is found more in areas covered by Haveli galli (35%) Urban health center followed by Shanti nagara (17%) UHC.

Adolescents and children are the prime targets of the tobacco industry when recruiting new smokers. About 20 million children of ages 10 – 14 are estimated to be tobacco - addicted according to a survey done by the National Sample Survey Organization of the Indian Government. Important studies done on schools & college students shows the prevalence of smoking has been found to vary from 6.9 to 22.5% among the male school and college students. Among the girl, the prevalence is considerable low varying from 0-2.3%.⁹

Md Shakeel Anjum et al found majority of 76.4% of the teenagers agreed that smoking habit gives psychological pleasure, 77.5% agreed that smoking starts because of friends and 65.7% felt that smoking starts as an inspiration for outlook and personality.¹⁰

Sharma R et al¹¹ concluded in his study that tobacco use as an important risk behavior among adolescent students. Around 88 (16.0%) students reported having ever tried smoking (cigarette or bidi). The prevalence of tobacco use overall was found to be 20.9%, and was significantly higher ($P=0.016$) among the males than the

females. The prevalence of current smoking was 7.1%. Exactly 10% (55) of the students reported having ever used smokeless forms of tobacco. Tobacco use was found to be significantly associated with having seen a siblings smoke (OR 5.15), best friend smoke (OR 2.92), and belonging to a nuclear family (OR 1.96).

The overall prevalence of tobacco use was 28.7%. Curiosity and peer pressure were the main reasons behind using tobacco. Tobacco use by parents or siblings had a significant influence on adolescents using tobacco. 65.1% of adolescent tobacco users were burrowing or stealing money for their tobacco use. 25.3% of adolescents had no knowledge regarding harmful effects of tobacco.¹²

Out of 1454 students, 1312 students completed the questionnaires with a response rate of 90.23%. Prevalence of ever use of any tobacco product was 19.7% (95% CI 17.7 to 21.6). More than half of the tobacco users (51.9%) consumed tobacco in public places whereas almost a third (75.6%) of the consumers purchased tobacco from shops. Multivariate analysis showed that tobacco use was associated with late adolescence (OR: 1.64; 95% CI 1.17 to 2.28), male gender (OR: 12.20; 95% CI 7.78 to 19.14), type of school (OR=1.72; 95% CI 1.01 to 2.94), Janajati ethnicity (OR: 2.05; 95% CI 1.39 to 3.01) and receiving pocket money \geq Nepalese rupees 500/month (OR: 1.45; 95% CI 1.04 to 2.03).¹³

George RM et al¹⁴ studied awareness about ill effects of tobacco among adolescent students showed out of the 407 children, 102 (25%) have tried cigarette

smoking, while 7.9% have tried smokeless tobacco. Almost 14.3% of them attempted to buy tobacco products and the shopkeepers sold it to them. A major proportion of the adolescents, 81.1% of them, believe that smoking can definitely cause harm to health, while 66.1% of them were aware about the harmful effects of passive smoking. About 73.7% were in favor of the idea of banning smoking in all enclosed public places.

Sreeramareddy CT et al¹⁵ studied tobacco use amongst junior collegiate in Nepal found overall prevalence of 'ever users' of tobacco products was 13.9%. Prevalence among boys and girls was 20.5% and 2.9% respectively. Prevalence of 'current users' was 10.2% (cigarette smoking: 9.4%, smokeless products: 6.5%, and both forms: 5.7%). Median age at initiation of cigarette smoking and chewable tobacco was 16 and 15 years respectively.

Conclusion

The prevalence of tobacco use found in Vijayapura city among adolescent age group is around one third of the overall, which is big number in itself to weaken the future generation. Smoking is not very well accepted by the Indian tradition and smokeless form is considered as safest form of tobacco and can be used. The present study also shows the maximum proportion of smokeless tobacco use. But the smokeless form of tobacco is equally harmful compared to smoking form. The young Indians have lot of addictions and distractions, which include tobacco as one of it. It is very necessary to control the tobacco habit & protect the young generation against the health hazards of tobacco use.

Recommendations:

Strict implementation of regulations of COTPA-2003 at public places & the educational Institutes is required. Awareness creation among young age group about health hazards of all forms of tobacco. Encourage health educational activities at schools especially regarding tobacco & health.

Acknowledgment:

I extend my gratitude to the stake holders at state level for allowing us to do the survey in the district and also to all the staff of department of community medicine for their direct and indirect contributions to the survey.

Source of Funding: Department of Health & Family Welfare, District Anti-Tobacco Cell, District Surveillance Office, Vijayapura – Karnataka.

Conflict of Interest: Nil

Ethical Clearance: Taken from the Institutional Ethics Committee

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Study of Mobile Phone Usage in Undergraduate Medical and Dental Students During Covid-19 Lockdown

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Abstract

Background: Mobile phones are increasingly becoming part of the daily life of today's youth. It has become an important accessory because of the various facilities they offer especially the internet. The Covid -19 outbreak and the subsequent lockdown has put all the people inside the home. To keep themselves engaged, most of the people are clinging onto their smart phones. All the academic sessions are taken through online. Hence the aim of the present study is to assess the mobile phone usage in undergraduate medical and dental students during Covid 19 lockdown. **Methodology:** A cross sectional study was conducted among 200 undergraduate medical and dental students of ACS Medical College and Thai Moogambigai Dental College, Chennai. Data were collected by pre-tested questionnaire in Google form and it was analysed using MS Excel software. **Results:** Out of 200 students participated in the study, 112 were females and 88 were males. Only about 44 students (22%) used 90-100 % of internet data before lock down and now about 102 (51%) students used 90-100% of internet data pack during lock down. About 21.5% of students spent more than 10 hours in their mobile phone during this lock down period. Majority of the students (56.5%) used mobile phones for entertainment purpose more than academic purpose (45.5%). There are also many health problems found to be reported due to usage of mobile phones like headache, sleep disturbances, fatigue, dry eyes etc. **Conclusion:** The results of this study confirms that there is excessive use of mobile phone among medical and dental students during lock down period which give an alarming indication that the students should not get addicted and more dependent on mobile phones that can lead to mental and health problems in them after the release of lock down. Parenteral control, students self discipline and conduction of online classes for a limited time can help them to overcome this.

Keywords: mobile phone, medical and dental students, Covid 19 lock down, internet data usage, health problems

Introduction

Mobile phone has become an integral part of everyone's life in this century. It is considered as an important accessory which has been carried by all everywhere. Actually the charm of cell phone is greater among youth and maximum amount of their pocket money has been spent on cell phone^[1]. Mobile phone and internet usage have become common practice especially

among the student community. The type and nature of this technology are constantly undergoing several changes to suit many types of users. Mobile Phone usage is rising to be a need of every person since they are equipped with various features other than voice call that allow further communications and entertainments such as the Whats app, MP3 player, games, internet, videos and policies like cashless transfer of money and transactions of different types has been done through it^[2]. Other than entertainment, mobile devices provides an opportunity to carry knowledge and learning outside of the boundaries of the classroom because students can interact with fellow students and teachers outside the classroom as well as capture the learning material using audio and video options^[3].

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In the last 20 years, worldwide mobile phone users have grown from 12.4 million to over 5.6 billion covering about 70% of the global population. There are reports of plenty of health hazards, both mental and physical, due to mobile phone usage in people of all age groups and it has also become an important health problem in the community^[4]. The addictive behaviour also has been shown by the users having both physical, psychological withdrawal symptoms when they stop using mobile phones like anxiety, restlessness & irritability^[5]. Self-reported symptoms like headache, earache, sensation of warmth and sometimes difficulties in concentration and fatigue are also associated with overuse of mobile phones^[6].

Always technology is a double-edged sword and the negative aspects will always prevail and dominate unless there is a check point. For students, awareness should be created about its side effects to limit excessive usage of smartphones so that they can be self motivated and also to certain extent by parental control^[7].

Nomophobia, a recently introduced term, an abbreviation for “no-mobile-phone-phobia” to look at anxieties suffered by mobile phone users which includes decreased face-to-face interactions, keeping the device in reach when sleeping, looking at phone screen frequently to avoid missing any notifications; also termed as ringxiety^[8].

The Covid -19 outbreak and the subsequent lockdown has brought unprecedented change to lives across the world as people stay indoors and work from home. They look for ways to keep themselves engaged and hence television viewing and smartphone usage for entertainment purpose have registered an unexpected rise. Lockdown also stopped the regular classes in between a running academic year which led to rethinking and re-planning of courses from offline to online resulted in clinging of students to their mobile phones. Hence the aim of the present study is to study the pattern of mobile phone usage in undergraduate medical and dental students during Covid 19 lockdown.

Objectives

1. To study the pattern of mobile phone usage during Covid 19 lockdown in undergraduate medical and dental students.

2. To analyse the sleep pattern and health effects due to mobile phone usage in undergraduate medical and dental students during this period

3. To assess the parenteral control of mobile phone usage and to analyse whether they are using mobile phones more for learning or entertainment purpose during this period.

Materials and Method

Study Design: Cross sectional study

Study Setting: Those who are residing in their homes due to Covid 19 lockdown

Study Population: Undergraduate I year Medical and Dental students of ACS Medical College and Hospital and Thai Moogambigai Dental College, Dr.M.G.R Educational and Research Institute, Chennai.

Sample size: 200 undergraduate Medical and Dental Students

Sampling Technique: Convenient sampling

Method of data collection: The data regarding the usage of mobile phone was collected by using a pre-formatted structured questionnaire in Google form based on respondent's anonymity. Pre-testing and pre validation were done and necessary modifications were made in the questionnaire. The purpose of the study was clearly explained to the students through message in Whats app, Questionnaire was shared to the students through whats app and were invited to participate in study at their own will. The Google form contained consent form in first section and questionnaire in second section. The link was made accessible to the students for three days (17th May 2020-19th May 2020) and once the sample size had reached, it was disabled. Then the data was entered and analysed with MS Excel.

Results

About 200 students of I year undergraduate medical and dental students of ACS Medical College and Thai Moogambigai Dental College responded to the questionnaire shared in Google form for about three days.

In the present study, 112 (56%) participants were

females and 88 (44%) students were males. About 77.5 % of students having one mobile phone, 22.5% of students possess two mobile phone/SIM and 0.5 % of students having more than two. It is also observed that 81% of participants having prepaid and 19 % of students using post-paid connection in their mobile phone (Fig.1).

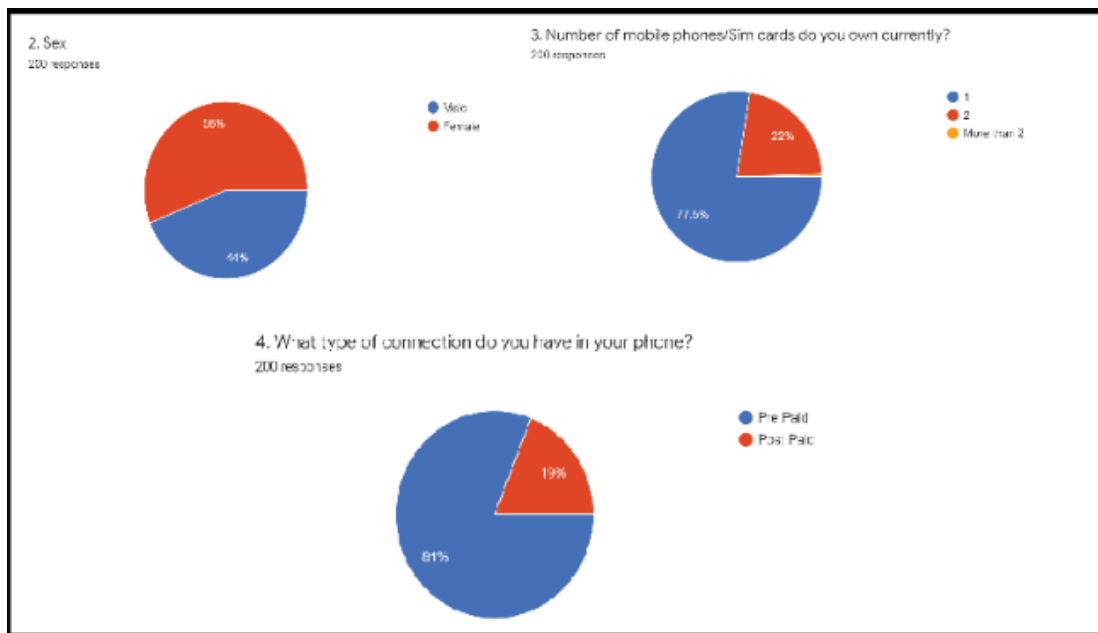


Fig.1: Gender distribution, Availability, Type of connection in mobile phone with the participants

In the present study, in majority, 79 (39.5%) students used 1.5GB/day data plan and 71 students (35.5%) spent more than Rs.500 for their internet data plan during Covid 19 lock down (Fig.2 and Tab.1). It is also observed that 38 (19%) students used different internet data plan during Covid -19 lockdown(Fig.2)

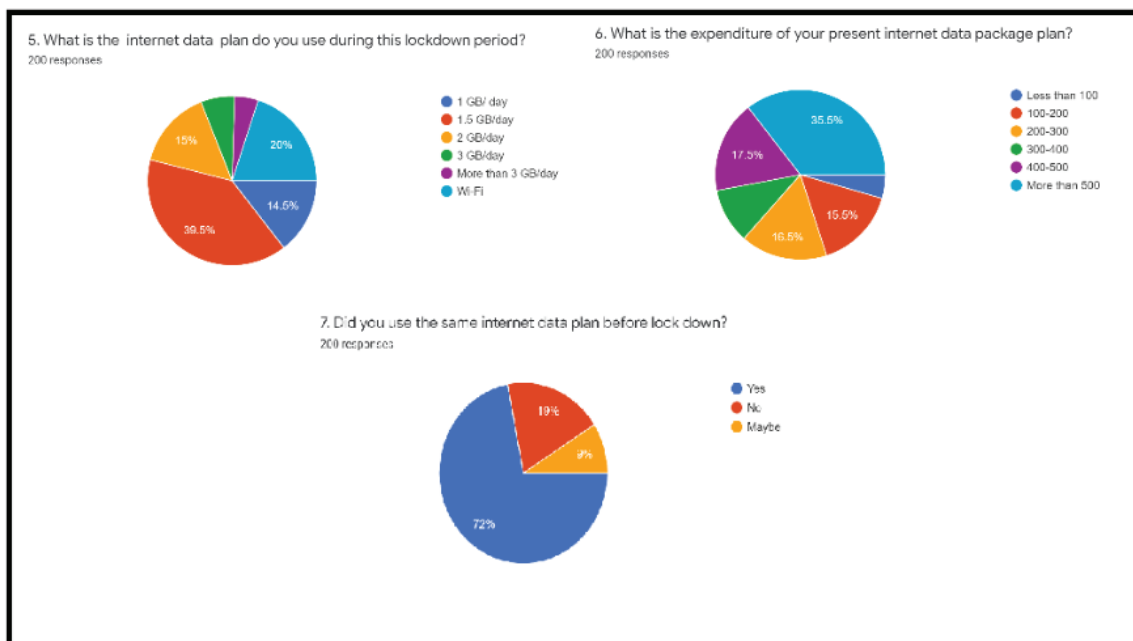


Fig.2: Data plan usage and expenditure spent on data plan spent during lock down/ Assessment of data plan before lock down

Tab.1: Showing the data usage plan and expenditure spent on internet package by the participants during Covid 19 lock down

S.No	Data Plan	No. of Students	S.No	Expenditure of Data Plan	No. of Students
1.	1 GB/day	29	1.	Less than 100	9
2.	1.5 GB/day	79	2.	100-200	31
3.	2 GB/day	30	3.	200-300	33
	3 GB/day	13	4.	300-400	21
5.	More than 3GB/Day	9	5.	400-500	35
6.	Wi-Fi	40	6.	More than 500	71

On comparing the internet data usage per day before and during lock down, it is found that 102 students (51%) consumed 90-100 % of internet data and 78 students (39%) used 50-60% of internet data during lock down. In contrast, before lock down, 44 students (22%) consumed 90-100 % of internet data and 112 students(56%) used 50-60% of internet data (Fig.3). On comparing the hours of mobile phone usage before and during lock down, it is understood that in majority, about 25.5 % of students spent 5-10 hours/day and 21.5% of students spent more than 10 hours in their mobile phone during lock down. In contrast, before lock down, 26.5% spent 2-3 hours/day and 21.5% spent 3-4 hours/day (Fig.3)

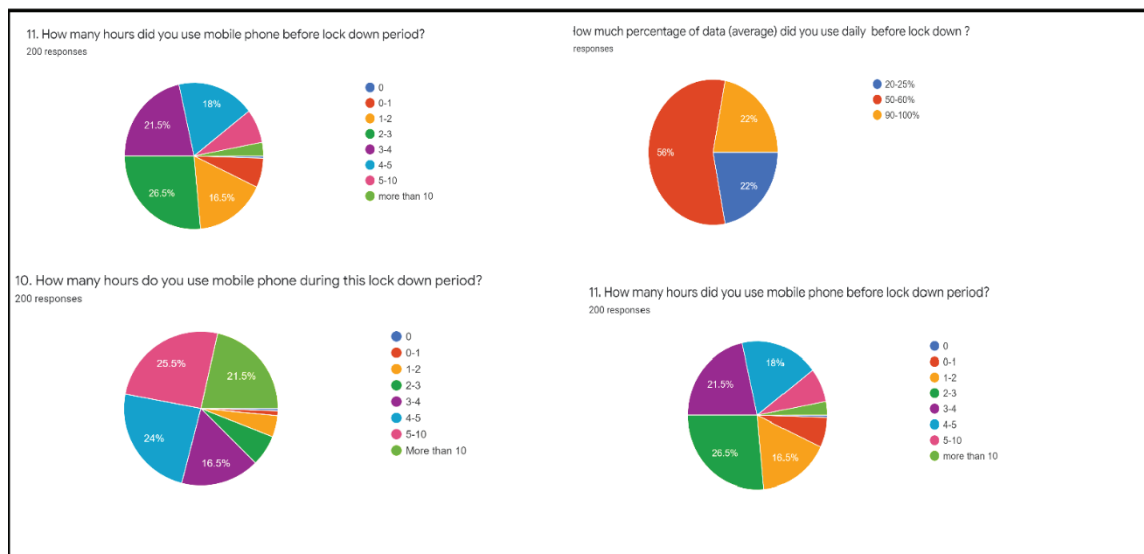


Fig.3: Comparison of internet data usage per day before and during lock down /

Comparison of hours of mobile phone usage before and during lock down

It is observed that the average daily sleep during lock down period as stated in the responses was about 6-8 hours by 42.5 %, 8-10 hours by 35.5% , 5-6 hours

by 16%% and less than 5 hours for remaining students. About 41.5% felt that their sleep quota is insufficient due to mobile phones use and 46% of students satisfied with their sleep. Mobile was kept on table nearby in majority (52%), near pillow/Head (23%), anywhere (14%) and on

bed (11%) while the students were asleep. 61.5% showed the habit of keeping their mobile phones switched on but internet/Wi-Fi OFF, 24.5% even kept internet/ Wi-Fi ON and 8 % kept mobile phones switched off (Fig.4).

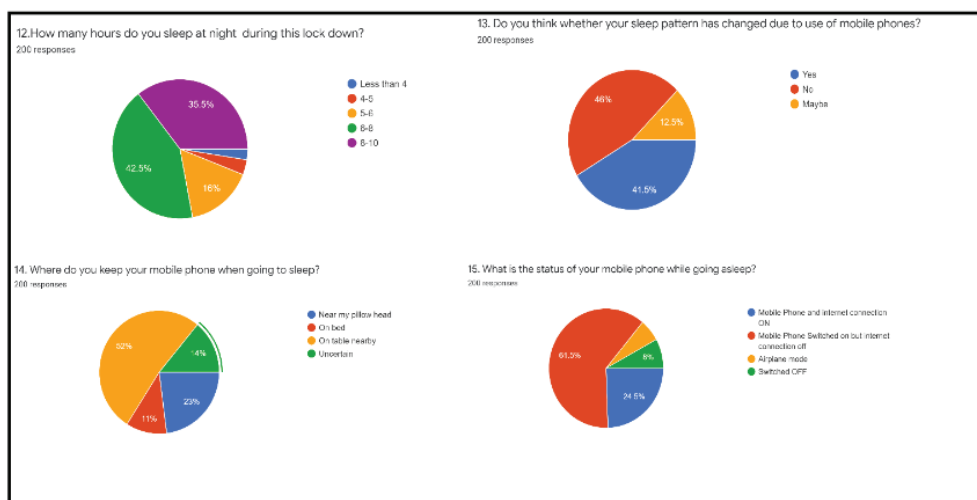


Fig.4: Effect of Mobile Phones on Sleeping Pattern during Covid 19 Lock down

It was found that 56% parents restrict usage of mobile phone, 28 % of parents does not restrict usage of mobile phone during Covid-19 lock down (Fig.5). It is observed that during Covid 19 lockdown, only 45.5 % students used mobile phones for academic purpose while the rest of the students used their mobile phones for entertainment activities such as watching movies, facebook, Instagram, whatsapp etc. About 20% of students felt excited, 20.5% felt depressed and 59.5% of students were neither excited nor depressed regarding usage of mobile phone for learning purpose (Fig.5). The various health problems faced by the students due to usage of mobile phones during Covid 19 lockdown are shown in Fig.5. About 52.3 % of students created awareness to the public regarding Covid-19 through their mobile phones during lock down period (Fig.5).

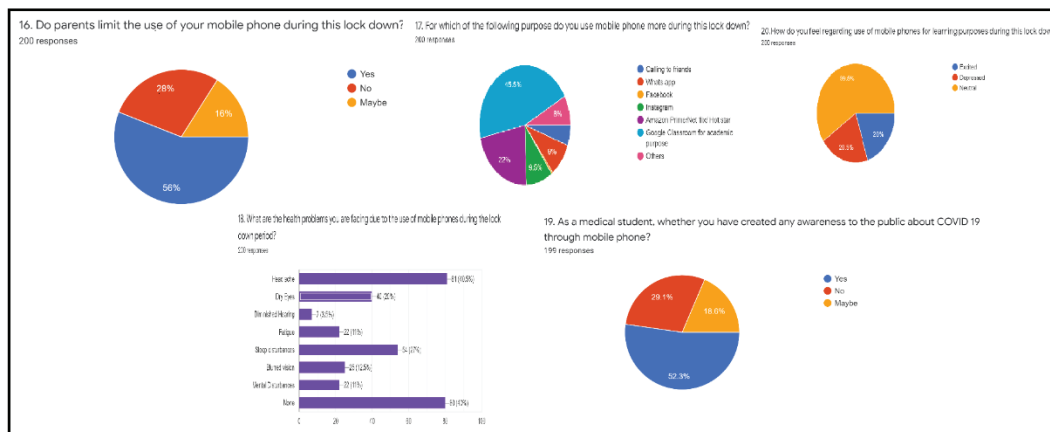


Fig.5: Parenteral control of mobile phone during lock down/ Purpose of mobile phone usage and Perception of mobile phone usage for learning purpose/ Health problems faced by the students due to mobile phone usage during lock down

DISCUSSION

In the present study, everybody had mobile phones and about 22% of students were having dual sim handsets / two mobiles with more than one contact number. In our study, 81% of participants having prepaid and 19 % of students using post-paid connection in their mobile phone which is exactly the same as the study done by Yadav et al^[4]. In India Macro Mobile Youth Study^[9] it was observed that 56% were prepaid users & 44% post-paid users.

In the current study, majority of the students were using 1.5GB/day internet data plan and interestingly about 9 students were using 3GB/ day data plan. About 35.5% of students spent more than Rs.500 for their internet data pack during lock down period and 19 % of students were using different data plan as compared to before lockdown period. On comparing the usage of internet data plan and average time hour spent on mobile phone per day before and during lock down period, both found to be increased during lockdown period. About 51% of students used 50-100% of internet data pack and 21.5% of student spent more than 10 hours/day on mobile phone which is more than that of before lock down period.

Majority of the students felt their sleep is insufficient due to mobile phone usage and 23 % had the habit of keeping mobile phones under their pillows. During lock down period, the students also reported to be suffering from health problems such as headache (40.5%), dry eyes(20%), diminished hearing (3.5%), fatigue(11%), sleep disturbances (27%), blurred vision(12.5%) and mental disturbances(11%) due to mobile phone usage.

About 23% of the students are not under the parenteral control of limited use of mobile phone. Majority of the students (56.5%) used mobile phones for entertainment purpose more than academic purpose (45.5%). 20 % of students felt depressed regarding usage of mobile phones for learning purpose. On the positive side, majority of the students created awareness to the public about Covid-19 through their mobile phones.

Considering the increased mobile phone usage by medical and dental students during lock down period, the results of this study suggest that the students may have important effects on their mental and physical health and academic performance after the release of lock down.

Conclusion

The observations in our study about usage of mobile phone during Covid 19 lock down is actually drawn from a small group of medical and dental students which may not reflect the worldwide scenario. In reality these results which got from small group of population, give an alarming indication that the students should not get addicted and more dependent on mobile phones during this lock down period, which may lead to serious

psychiatric and health problems among them after the release of lock down. Parenteral control should always be there when the students are using their mobile phones for a longer time and students themselves should fix a time for their mobile phone usage during lock down . Even after the release of lock down, they should follow the same. Conduction of online classes for a limited period of time can also avoid the health problems faced by them. As double edged sword ,the mobile phones, if utilised in better manner and in a correct way can be very well beneficial or if used in excess and in a wrong way, it may be a public health problem.

Ethical Clearance: Taken from Institution Ethics Committee

Source of Funding: Self

Conflict of Interest: None

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Meteorological Conditions Associated with AES/JE Outbreak 2019 in Bihar

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Abstract

Analysis of the incidences of AES during 2019 over Bihar brought out the highest incidence of AES cases in June (78.5%) followed by July (12.6%). A similar pattern was found in the number of deaths associated with AES. Maximum incidences were reported from Muzaffarpur (559) and East Champaran (113) districts in north Bihar; and Gaya in south Bihar (72). More than 50% of the incidences and deaths were reported from children up to the age of 5 years; and more than 90% from children up to the age of 10 years indicating high vulnerability of children. Female children were found to be impacted more with 53% of the total incidences and 58% of the total deaths.

The highest percentage of AES cases (78.5%) were reported in June followed by July (12.6%). The highest percentage of deaths were reported in June (69.5%) followed by July (19%). An analysis of the incidences of AES cases in the worst affected district (Muzaffarpur) shows a high degree of correlation with the maximum temperature of the past few days. A second-degree polynomial best described the relationship between the mean maximum temperature of the last two days and the incidence of AES cases in Muzaffarpur district ($R^2=0.74$).

Keywords:- Mean Maximum Temperature, Acute Encephalitis Syndrome, AES, Heat Index, Monsoon, Bihar, Muzaffarpur

Introduction

Acute Encephalitis Syndrome (AES) defined as acute onset of fever and a change in mental status including symptoms such as confusion, disorientation, or inability to talk and/or new onset of seizures excluding febrile convulsions is thought to be caused by a wide variety of conditions. Multiple factors like viruses, bacteria, fungi, parasites, and toxins may cause AES¹. It is estimated that a population of 375 million is at risk of acquiring AES in India². Besides the JE virus, other viruses that have resulted in a high incidence of AES in India are Dengue virus, Enterovirus, Herpes Simplex Virus, Measles and Chandipura virus³. However, the etiology of AES

remains unknown in 68-75% of patients⁴. The history of AES in India is documented in association with JE, with the virus first being reported from southern India in 1955. The sources of viral infection resulting in AES may differ across regions⁵. The most common of AES is Japanese encephalitis (JE) - a vector-borne viral disease caused by the JE virus of group B arbovirus (Flavivirus) and is transmitted to humans by the **Culicine Mosquito**. JE generally affects the central nervous system and can cause serious complications and death with a high fatality rate⁶. The survivors may also experience convulsions, episodic headache, abnormal behavior, intellectual deficit, incoordination of movements, jerky limb movements, speech disorder, cranial nerve palsy, gaze palsy, parkinsonian features, impaired hearing, etc. Incidence is high among the children due to a lack of immunity from natural infections. The disease has a high rate of death (about 25%) among the infected children. About 30% - 40% of the survivors suffer from physical

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and mental impairment⁷. The disease was first recognized in Japan in 1924. JE has been reported to be endemic in large parts of the Asia and Pacific regions, especially in the South Asian and Western Pacific regions⁸. Nearly 42% of 3187 reported cases of JE were from countries in the South-East Asia region, with India alone accounting for about 80% of these cases. JE has been identified as the primary cause of the syndrome⁸. Tiwari et al. attributed a fatality rate of 30%–50% to JE in southern and eastern Asia. The outbreaks of JE in Gorakhpur and Basti divisions in eastern UP during 2005, led to the development of surveillance guidelines for AES and JE by the National Vector Borne Disease Control Programme (NVBDCP). These guidelines required JE to be reported as an AES and after confirmation from the sentinel sites, a line-list of JE cases needed to be drawn and sent in prescribed formats⁹. Outbreaks of acute encephalitis syndrome (AES) have occurred previously in the northern regions of Bihar state and eastern regions of Uttar Pradesh state of India. The first case of AES in Muzaffarpur district was recorded in 1995. Muzaffarpur district, suffers repeated epidemics of acute encephalopathy in children for the past 16-17 years. Initially, the focus of the disease outbreak was limited to the Muzaffarpur district but the recent trend shows that it has spread to many other districts in Bihar¹⁰. Extreme heat and humidity of Muzaffarpur causing heat stroke leading to encephalopathy along with a sudden drop in cases when the rains set in and the temperatures dropped has also been reported in a study¹¹. As per reports of State Surveillance Unit, IDSP, State Health Society Bihar, the peak of the AES outbreak in Bihar has been observed in June that has been consistent since the last five years¹². The total cases & number of deaths reported in 2017, 2018 & 2019 in Bihar has been 268 & 56; 179 & 45, and 1089 & (236), respectively. In 2019, AES cases were reported from 34 districts in the State. The majority of the cases were reported during 2019 were from Muzaffarpur followed by East Champaran, Vaishali, and Gaya. The age group most affected was 0-5 years (53.44%) and 5-10 years (37.37%). Females (53.16%) were more affected than males (46.83%).

The present report informs about the epidemiology of AES in Bihar as well as its meteorological interpretation. The report also highlights the use of meteorological data to establish co-relation with the AES outbreak. The meteorological data may be used to generate Early

Warning Signals for the AES outbreak and thus help in the preparedness of the Health Sector to prevent any future impending outbreaks in the State.

Climate of Bihar

Bihar is a land-locked state that mainly comes under the climate type subtropical monsoon, mild and dry winter, hot summer except the districts of Jamui, Banka, Munger, Lakhisarai, Khagaria, Sheikhpura and some parts of Bhagalpur, Saharsa and Begusarai located in the extreme southeastern part of the State which comes under the type Tropical Savanna, Hot seasonally dry¹³ (usually winter). May is the hottest month with a mean maximum temperature of about 37°C in the plains. The mean maximum temperature ranges from 34°C to 40.5°C over the state during May with the southern parts of the state being the hottest and the northern parts being the coldest. In January, the minima of the mean minimum temperature are observed over the eastern region of the state. The skies are heavily clouded during the South West Monsoon season (June-September), particularly during July and August¹³.

The total average annual rainfall of the state is 1194.9 mm with an average of 50 rainy days.

The Southwest monsoon sets in over eastern parts of the state by about the middle of the second week of June. July and August are the rainiest months, accounting individually, to about 28% and 24% of the annual rainfall, respectively. Withdrawal of the southwest monsoon begins from the northern parts of the state in the first week of October¹³.

Data and Methodology

Bihar is one of the 36 Metrological subdivisions of India with four Departmental observatories at Patna, Gaya, Bhagalpur and Purnea, and seven part-time Observatories. Meteorological data from one of the observatories located in Muzaffarpur city has been used for analysis in this study. Data on the incidence of AES cases (known and unknown) and associated deaths were collected from the daily reporting and monitoring of the cases being done by the State Surveillance Unit, Integrated Disease Surveillance Programme. The program regularly shares the data with concerned district administration for proper and timely intervention to control the disease outbreak (Source: State Surveillance

Unit, IDSP, State Health Society, Bihar).

Results and Discussion

Analysis

Changes in weather patterns and precipitation affect the evolution of many infectious vector-borne diseases like Malaria, Chikungunya, Japanese Encephalitis, Filariasis, etc. It has found that Acute Encephalitis Syndrome (AES), a deadly brain disease generally affects children of age between 0-15 years. Normally, the children experience symptoms like sudden falls in blood sugar which ultimately causes death. There were a total number of 1089 AES known and AES unknown cases reported across the Bihar during the year 2019. Seven of these cases were from the adjoining state of Jharkhand and one from Nepal. Out of these 1081 cases, 232 (21.5%) cases reported death. Out of the total 715 known cases of AES, 554 (77.4 %) were of Hypoglycemia and 130 (18.2%) were of Japanese Encephalitis. Out of all known cases of AES, 23.15 % of patients died because of Hypoglycemia, Japanese Encephalitis, etc. A description of all the 1089 cases is given in Table 1.

Temporal Distribution:-

Month-wise incidences of AES cases and associated deaths are given in Figure 1 below. The highest percentage of AES cases (78.5%) were reported in June followed by 12.6% in July and 3.2% in August. Similarly the highest percentage of deaths were reported in June (69.5%) followed by July (19%) and August (6%). The outbreak of AES occurred mainly from 4th June 2019 to 26th June 2019. The cases significantly decreased after the onset of Monsoon in Bihar (23rd June 2019). This seasonal distribution is very similar, to the monthly pattern of AES in Bihar reported earlier¹⁴.

Spatial Distribution:-

Acute Encephalitis Syndrome (AES) cases were reported from all parts of Bihar except the districts of Gopalganj, Bhabhua, Khagaria, and Lakhisarai. Highest numbers of cases were reported from central districts of north Bihar, i.e., Muzaffarpur (559) followed by Purbi Champaran (113), Vaishali (86) and Samastipur (57). Gaya district in south Bihar also reported a high number of incidences (72). A similar pattern was also

observed in the reported number of deaths with the highest number of deaths (110) Muzaffarpur followed by Purbi Champaran (26), Vaishali (20), and Sitamarhi (19). Gaya district in south Bihar reported 16 deaths. The geographical distribution of total AES cases is given in Figure 2. Similar distribution has been reported in the state earlier also¹³.

Agewise and genderwise distribution:

Almost all of the 1081 AES cases were from the Children aged between 0-15 years with maximum impacts on children in the age group of 0-5 years (53.2%). 37.6 % of cases were from the age group of 5 to < 10 years and 8.6% from 10 to < 15 years ago. Only 3 cases of age 15 years or more were reported. Of the 232 cases of AES related deaths, 52.6 % were from the age group less than 5 years, 38.4% from 5 to less than 10 years, and 8.2% from 10 to less than 15 years. The highest number of deaths in all the age groups were reported from Muzaffarpur district. Female children were found to be impacted slightly more by AES. Out of the total 1081 reported cases, 46.8% were male and 53.2% were female. Out of the total 232 AES related deaths, 98 were male and 134 were female (Table 2).

Relationship of AES incidence with temperature in Muzaffarpur district:

As the highest number of cases were reported in Muzaffarpur district, a detailed analysis of its relationship with temperature carried out for Muzaffarpur district for the month of June as the month accounted for about 90% of the cases. Correlation coefficients (CC) were found between the incidences of AES and maximum temperature of the previous day; and the mean maximum temperatures of previous 2, 3, 4, 5, 6, and 7 days. The CC was 0.79 with the maximum temperature of the previous day; and 0.82 with the mean maximum temperature of the previous 2 days. Correlation coefficients were also computed between AES incidences and Heat Index for the day. The highest correlation coefficient of 0.56 was found with the heat index of previous day. The plot of the day to day incidences of AES against the mean maximum temperatures of the previous 2 days given in Figures 3 shows that the incidences of AES generally fluctuated with maximum temperatures. Scatter plot of AES incidences against the maximum temperature of the previous day and the mean maximum temperature

of the previous 2 days given in Figure 4 show that the number of AES cases increased exponentially with increase in temperature. A second degree polynomial was found to best defines the variability in AES cases with an R2 value of 0.74. The average numbers of cases were 2.6 cases on the days when maximum temperatures were 33 to 35 Deg C. These were 15.4 and 19.6 on days with temperature 35 to 37 Deg C and 37 to 39 Deg C;

Units of Measurements

Temperature:- Degree Celsius (°C).

Abbreviations and Symbols

AES: - Acute Encephalitis Syndrome, JE: - Japanese Encephalitis, JES: - Japanese Encephalitis Syndrome

Table 1. Analysis of AES Cases in Bihar during 2019

Description	Total Cases	Deaths
Total AES	1089	236
Total AES Unknown	372	70
Total AES Confirmed	717	166
JE +ve	130	27
Meningitis/ Meningoencephalitis /Tubercular Meningitis/Pyogenic/Aseptic Meningitis./Acute Meningococcal	6	0
Herpes/Measles/ Pox/Mumps/Viral Encephalitis	7	3
Hypoglycemia	554	134
Dyselectrolytemia	3	2
Chicken Pox	1	0
Others: Heatstroke, Hyper-pyrexia.	16	0

Table 2. Age and gender wise distribution of total AES cases

	Age/Gender	Number of AES Cases	Number of Deaths
Age*	< 5 years	582	125
	5 to <10 years	407	90
	10 to < 15 years	93	19
	15 years or more	3	0
Gender	Male	510	98
	Female	579	138
Total		1089*	236*

* Age not known for 4 cases and 2 deaths

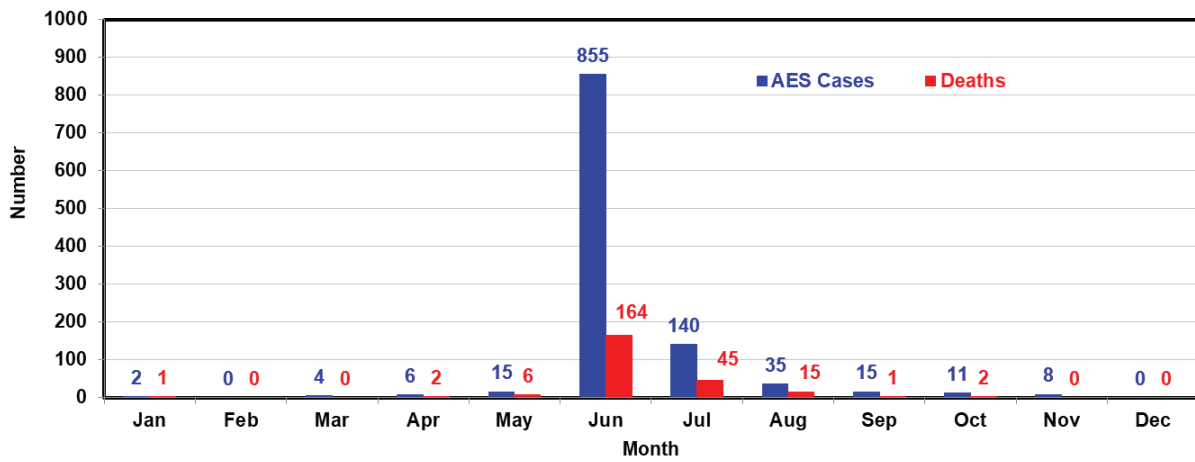


Figure. 1. Monthwise distribution of AES cases and reported death of Bihar in 2019.

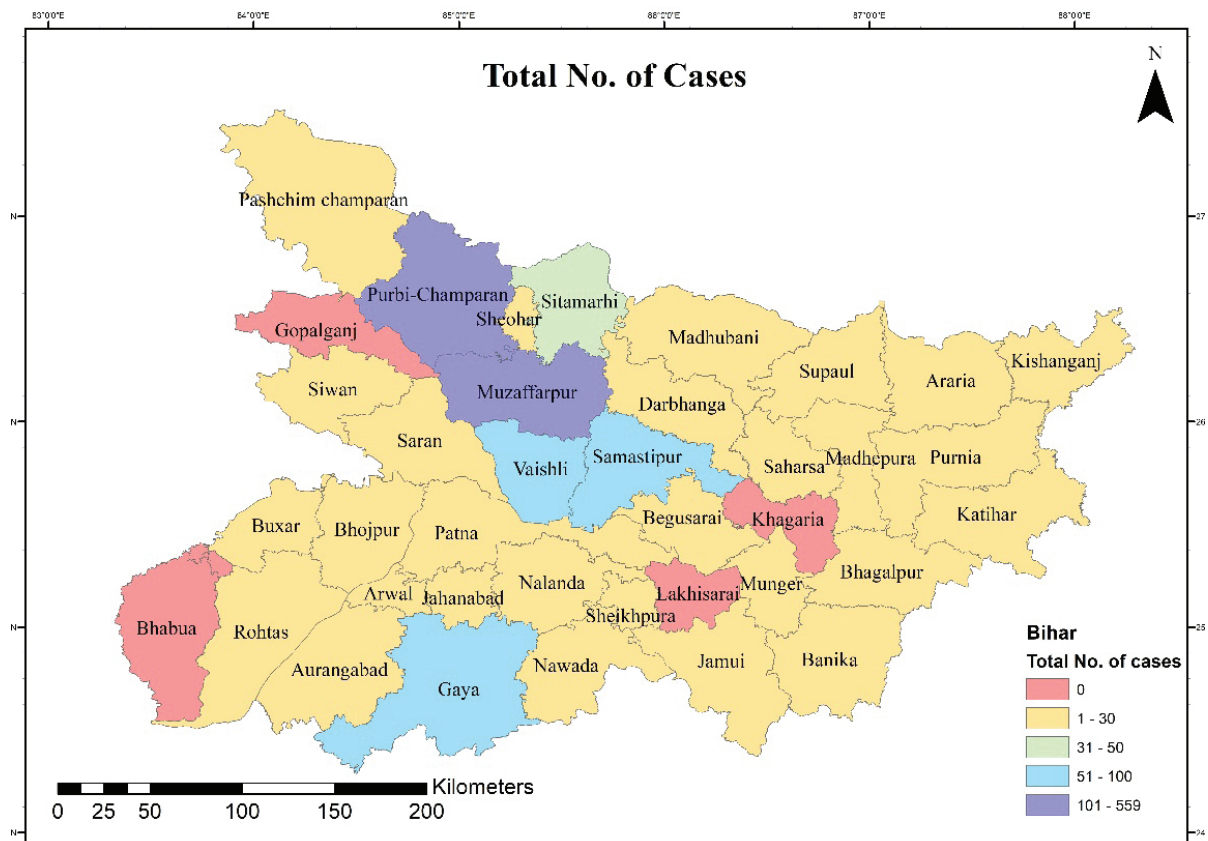


Figure. 2. Districtwise Distribution of AES cases in Bihar

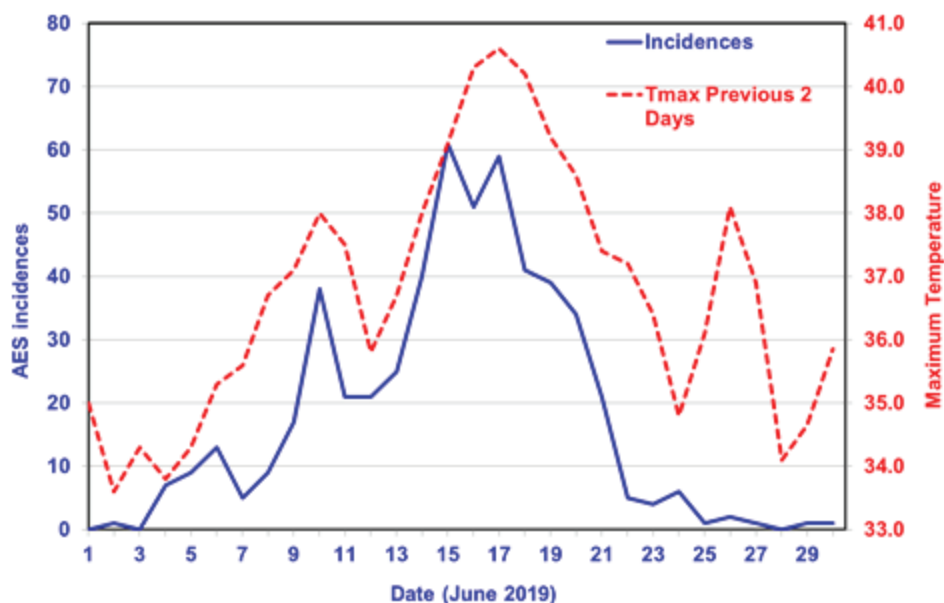


Figure. 3. Day to day incidences of AES cases in Muzaffarpur district and Mean Maximum Temperature of Previous 2 days during June 2019

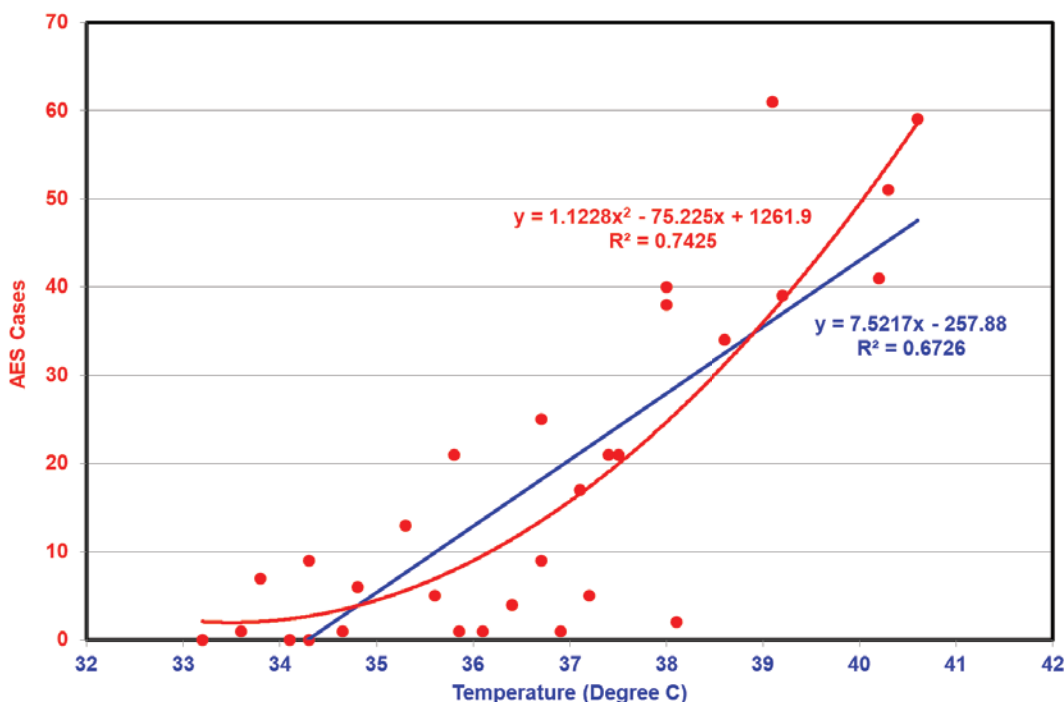


Figure. 4. Relationship between AES cases and Mean Maximum Temperature of Previous two days for Muzaffarpur, June, 2019 and 52.8 on days with temperature more than 39 Deg C.

Conclusion

Analysis of AES incidence during summer 2019 brought out that maximum impact was on children in the age group of 0-5 years (53.2%) with only 8.6% from 10 to < 15 years ago. Of 232 cases of AES related deaths, 52.6 % were from the age group less than 5 years.

In the most affected district – Muzaffarpur, the incidences of AES was found to have a very high correlation (0.82) with maximum temperature with a lag of two days during the month of June. Increase in number of AES cases with maximum temperature brings out a possibility that advance warning on temperature

could help the health system prepare better to combat the AES.

Ethical Clearance: Not Required

Source of Funding: Self

Conflict of Interest: Nil

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Enhancing Health Education about Carcinogenic Liver Fluke among Migrant Labourers

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Abstract

Liver fluke, *Opisthorchis viverrini* infection is associated with hepatobiliary diseases including cholangiocarcinoma. The spread of liver fluke infection may occur in Southeast Asia due to increased labour migration among the countries of the ASEAN Economic Community as a result of an open borders policy that started in 2015. Therefore, a migrant health and education programme (MHEP) was organized and delivered by a migrant health and education network team. This study was conducted from March 2018 to October 2019 among migrant labourers from Cambodia, Laos PDR, and Myanmar who work in Nakhon Ratchasima Province, Thailand. Participants experienced a high level of satisfaction with the MHEP and gave the programme positive feedback. The MHEP has achieved its objective to increase the accessibility of health services among migrant populations in factory settings. Sharing this successful programme may also be useful in other areas.

Keywords: Health Education, Liver Fluke, Migrant Labourers

Introduction

More than 10 million people in the Association of Southeast Asian Nations Economic Community countries (particularly Thailand, Lao People's Democratic Republic, Cambodia, and Vietnam) suffer from either liver infections¹. Liver fluke infection is caused by chronic *Opisthorchis viverrini* infection and is associated with cholangiocarcinoma (CCA)^{2,4}. Persistent and chronic infection can cause severe cancer complications, particularly CCA⁵. In 2014, the national prevalence rate of *O. viverrini* was 5.1% among 15,555 Thais in certain areas of the country. The decreased infection rate indicates that liver fluke is under control and elimination is possible through the prevention and control campaign. However, *O. viverrini* infections, which are commonly found in Cambodia and the Lao PDR, have been reported and constitute a serious

health problem in this country⁶⁻⁹. In Myanmar, *O. viverrini* infection has been reported for the first time in communities from three regions, where 9.3% of those sampled were found to be *Opisthorchis* egg positive¹⁰.

Based on the above data, there is cause for concern about this parasite among migrant labourers who work in Thailand. Liver fluke infection is spreading in Southeast Asia due to increased labour migration among the countries in the ASEAN Economic Community as a result of an open borders policy in 2015¹¹. Therefore, the migrant health and education programme (MHEP) was organized and delivered by a migrant health and education network team, which was initiated and assisted by the Parasitic Disease Research Center (PDRC), Institute of Medicine, Suranaree University of Technology (SUT). The success of this programme might provide an advantage for further works in other areas.

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Materials and Method

Study design, setting, and participants

This study was conducted from March 2018 to October 2019 among the individuals aged 20–60 years old among migrant labourers from Cambodia, Laos, and Myanmar who work in the Muang Nakhon Ratchasima, Soeng Sang, and Pak Chong districts of Nakhon Ratchasima Province, Thailand. The study area is located in the northeastern region of Thailand. The study area is 260.5 kilometres from Bangkok (the capital of Thailand). 144 volunteer participants were recruited from 3 factories.

Development of the migrant health and education programme initiative

The MHEP was developed by the Migrant Health and Education Network Team (MHENT), which was initiated by the PDRC. The MHENT includes (1) PDRC members: a parasitologist, medical doctor, medical technologist, registered nurse, public health officer, occupational health officer, safety officer, computer and data expert, translators, and collaborators; (2) company members: a manager, human resource officer, registered nurse, occupational health and safety officer, and migrant health volunteers; and (3) members of the government sector: officers from the Department of Disease Control and the Ministry of Public Health, local health personnel in the study areas, and officers from local employee office. The MHEP comprises (1) a health check-up by a medical doctor, registered nurse, and public health officer; (2) risk screening for liver fluke infection using a verbal screening test¹²; (3) faecal collection and examination for liver fluke infection^{13,14}; (4) CCA screening using ultrasonography; (5) health education by the educator team; (6) the creation of a database by a computer and data expert; and (7) follow-up and monitoring by the MHENT, migrant health volunteers, and translators/native persons.

Health education programme

Patients infected with *O. viverrini*, were treated with praziquantel and then CCA screened using ultrasonography. The health education programme was implemented, and it included the following content: basic information regarding liver fluke and CCA facts and figures, epidemiology, risk factors, signs and symptoms.

Data collection tool

The data collection tool consisted of a questionnaire with four sections including semi-structured with open-ended questions related to demographic factors, the risk score of liver fluke infection, the level of service satisfaction, and participants' feedback in response to the following open question. Data were collected through a questionnaire constructed by the researcher, and content validity was confirmed. For this purpose, the questionnaire was developed as previously reported¹².

Statistical Analysis

The data obtained were analysed using SPSS version 22.0 (IBM, USA). *Multivariate analysis* was used on the demographic and infection data. In all tests, the level of significance was $\alpha < 0.05$.

Results

Among the 144 participants screened, 25 were found to be positive for intestinal helminthic infections. The most common infection was *O. viverrini* (Table 1). The past histories of participants and their families related to the risk of *O. viverrini* infection were shown in Table 2. The *O. viverrini* eggs positives were categorized by general characteristics as shown in Table 3. Participants' satisfaction with the MHEP was as follows: very satisfied, (66.67%); satisfied, (24.31%); neutral, 10 (6.94%); dissatisfied, 2 (1.39%) and very dissatisfied, 1 (0.69%). Most of the feedback indicated that respondents were satisfied with the MHEP and that they were satisfied with the free examination for and treatment of parasites, ultrasonography for CCA screening, and health education, including information about the risk factors for liver fluke infection, the importance of CCA, and the side effects of medications. Some of the happiest experiences individuals had as participants of programme included the following: the friendly and understandable way that MHEP members communicated with them and the free mobile clinic that came to their factories. The participants never had ultrasound examinations. The individuals gave no answer about their saddest experience as participants of the programme. In addition, the participants were in favour of expanding the programme and having it continue for a long time for them and others who lacked opportunities.

Table 1 Helminthic infection of 144 migrant labourers in Nakhon Ratchasima province, Northeastern Thailand

Nationality	No. Examined	No. Infection (%)	Intestinal Helminthic Infection (No. Infection (%))			
			<i>O. viverrini</i>	<i>S. stercoralis</i>	<i>T. trichiura</i>	Hookworm
Lao PDR	18	2 (11.11)	0 (0)	2 (11.11)	0 (0)	0 (0)
Cambodia	83	15 (18.07)	13 (15.66)	2 (2.40)	0 (0)	0 (0)
Myanmar	43	8 (18.60)	0 (0)	2 (4.65)	2 (4.65)	4 (9.30)
Total	144	25 (17.36)	13 (9.03)	6 (4.17)	2 (1.39)	4 (2.78)

Table 2 Past histories of participants and their families related to the risk of *O. viverrini* infection

Past histories/behaviour	Yes	No
	n (%)	n (%)
raw or undercooked fish salad consumption	47 (32.64)	97 (67.36)
raw fermented, and pickled fish consumption	118 (81.94)	26 (18.06)
raw minced cyprinoid fish consumption	87 (60.42)	57 (39.58)
liver fluke infection	16 (11.11)	128 (88.89)
relative family had ever infected liver fluke	20 (13.89)	124 (86.11)
relative family consumed raw fermented, pickled and minced cyprinoid fish	100 (69.44)	44 (30.56)
relative family had cholangiocarcinoma.	12 (8.33)	132 (91.67)
live near the natural water (approximately 10 kg.)	96(66.67)	48(33.33)

Table 3 Positive rate of *O. viverrini* eggs categorized by general characteristics

Variables	No. Samples n(%)	No. positive n(%)	Infection rate (%)	Crude OR	ORadj	95% CI	P-value
Gender							
Female	52 (36.11)	4 (7.69)	2.07	1.00	1.00	0.35-1.39	0.312
Male	92 (63.89)	9 (9.78)	6.25	0.57	0.70		
Age							
<40 years old	105 (72.92)	9 (8.57)	6.25	1.00	1.00	0.95-1.08	0.616
>40 years old	39 (27.08)	4 (10.26)	2.78	2.19	1.90		
Nationality							
Myanmar	43 (29.86)	0 (0)	0.00	1.00	1.00	0.47-1.45	0.004
Lao PDR	18 (12.50)	0 (0)	0.00	1.04	1.20		
Cambodia	83 (29.86)	13 (15.66)	3.03	2.45	2.83		
Factories site (District)							
Mueang	72 (37.30)	0 (0)	0.00	1.00	1.00	0.37-1.77	0.050
Soeng Sang	13 (6.73)	0 (0)	0.00	1.27	1.76		
Pak Chong	108(55.95)	13 (12.04)	9.03	2.25	2.21		
Risk scores							
No	11 (7.64)	0 (0.00)	0.00	1.00	1.00	1.35-2.72	0.033
High	13 (9.03)	9 (69.23)	6.25	2.62	3.42		
Moderate	33 (22.92)	3 (9.09)	2.08	2.34	2.02		
Low	87 (60.42)	1(1.15)	0.69	1.66	1.77		

Discussions

Based on the data reported, some countries in Southeast Asia still have a problem with liver fluke, *O. viverrini* and CCA¹⁵. Previous studies indicate that Nakhon Ratchasima province has a low prevalence of liver fluke infection. Out of all samples examined, 2.01% (199 samples) were positive for *O. viverrini*¹³. A total of 1,168 stool samples were examined and showed that 2.48% individuals were infected with *O. viverrini*¹⁶. In this recent study, among the 144 participants were found *O. viverrini* (9.03%). This result indicates that migrant people still have a high rate of infection. A previously reported among 403 immigrant labourers in Nakhon Ratchasima, *O. viverrini* infection was identified in 25.6% of Cambodians, 15.3% of Laotians and 3.6% of the labourers sampled from Myanmar¹⁷. Furthermore, there are other reports that Cambodia and Laos have a problem with this parasite based on survey results from each country. In Cambodia, the prevalence of *O. viverrini* infection was found to be positive at rate of 4.6–50.6%^{8,9,18}. In Laos, the prevalence of *O. viverrini* infection was 50-61%^{6,7}. The first report of *O. viverrini* infection in human communities in Lower Myanmar found that *Opisthorchis* eggs were positive 9.3%¹⁰. Our recent study found that the majority of participants consumed raw, fermented, and pickled fish; minced cyprinoid fish; fish salad and that they lived near natural water. This result confirms that these individuals are an at-risk group and that they have a lack of knowledge about liver fluke prevention and control. In addition, the past history of these individuals shows that 11.11% had histories of liver fluke infection and that their family consumed raw, fermented, pickled and minced cyprinoid fish, had been infected with liver fluke, and had CCA. This result is similar to the results of previous studies showing that many migrant people favour the consumption of raw or undercooked cyprinoid fish, which is the intermediate host of liver fluke¹⁷.

Based on previous data screens and surveys over the past 3 years, including this recent study, demographic data are associated with liver fluke infection to a statistically significant extent. From these data, we selected the participants to educate in the project of the MHEP. In the initial step, the MHEP was organized by the PDRC and assisted by companies' related personnel in the screening of the risk group by a verbal

screening test and the collection of faecal samples for liver fluke examination. We used a walkthrough survey that screened migrant labourers in Nakhon Ratchasima province over 3 years, and, in the first year, we found many problems. However, after doing the survey for several years, we found the best way to carry out the project of decreasing liver fluke and CCA in these migrants. We have cooperated with company members, including company managers, human resource officers, registered nurses, and occupational health and safety officers, with assistance from the officers of the Nakhon Ratchasima Provincial Employment Office and the Department of Disease Control, Ministry of Public health. The other key for success in setting up the MHENT, beyond help from the personnel of companies and government sectors, is migrant health volunteers and translators who are the migrant workers that are deemed trustworthy by members. In the MHENT, this network is flexible but concentrated with PDRC members and human resource officers, registered nurses, occupational health and safety officers, and migrant health volunteers in each company or factory. To understand and develop our project, we evaluated participant satisfaction and their feedback. Participant satisfaction is one of the most important performance and quality outcome indicators for healthcare delivery services that refers to a participant assessment of the services received from the healthcare provider¹⁹⁻²¹. With participant feedback, the quality of health services can be evaluated and monitored. Participant satisfaction can be influenced by past experience, lifestyle, individual value, and level of knowledge. Our results show that most participants had a high level of satisfaction with the MHEP. Participant satisfaction can also be influenced by the individual level of expectations about the provided services, which depend on the person's knowledge of the standard operating procedures of the service provider^{21,22}. However, most of the participants who gave feedback were satisfied with the MHEP and said that they were satisfied about the health services provided, including the free examination and treatment for parasites, ultrasonography screening for CCA, and health education, including information about the risk factors of liver fluke infection, the importance of CCA, and the side effects of medications. In addition, their happiest experience when attending the programme was with the friendly and understandable communication of

the MHEP members, as well as the free mobile clinic that came to their factories. Furthermore, the participants favoured the expansion of the programme to them and others who lacked opportunities.

Conclusion

In this study, a network was set up from top to bottom to increase its sufficiency and success. The MHEP implemented by the MHENT has achieved its objective to increase the accessibility of health services among migrant populations in factory settings. The sustainability of the programme is of concern and should be the focus of future work. Policy and collaboration in migrant health regarding liver fluke and CCA, by the Ministry of Public Health and Ministry of Labour, are the keys for successes and sustainability.

Ethical Clearance

This study was approved by the Ethics Committee affiliated with the University of Technology, Thailand (EC 61-04).

Source of Funding: This study was supported the grant from Suranaree University of Technology, Thailand, (SUT-IRD-2019)

Conflict of Interest

The authors declare that they have no conflicts of interest.

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A Descriptive Cross Sectional Study on Assessment of Haemoglobin Level and Factors Associated with Anemia During Pregnancy among Pregnant women attending OBG Unit of SNMC HSK Hospital and Research Centre Bagalkot, Karnataka

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Abstract

Background of the Study: Anemia in pregnancy is the public health problem which prime cause of maternal death in the world and also in India.

Objectives of the Study: To assess the hemoglobin level and find the factors associated with the anemia during pregnancy.

Materials and Methods: A descriptive cross sectional study was conducted at OBG Unit of SNMC, HSK Hospital and research center, Bagalkot, Karnataka. The data was collected by using interview schedule with structure questionnaire and hemoglobin values were taken from medical records and ANC Card of the pregnant women from 21/11/2019 to 30/01/2020 for this study.

Results: A sample of 100 (47 anemic and 53 nonanemic) were included in the study. Findings show that the family type, vaginal bleeding during pregnancy, miscarriage, infertility and malaria was significantly associated with anemia during pregnancy among pregnant women.

Conclusion: The researcher found that concentrating on above associated factors with anemia among pregnant women, which helps to overcome with this problem and more research study is needed with large scale sampling and aware the importance of regular maternal care which are the potential to play a more significant role in the health care.

Key words: Hemoglobin, pregnant women, associated factors, anemia.

Introduction

A healthy woman makes a happy family and builds happy nation. Woman will be having so much

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of problems during her life cycle. Pregnancy is one of the wonderful and noble services imposed by nature on women. Most of the women may not have many problems during pregnancy, but some are not lucky, faces various problems related to pregnancy and child birth. Anemia in pregnancy is the prime cause of maternal death in the world and also in India. World Health Organization (WHO) estimates 529,000 maternal deaths globally each year. A majority of maternal deaths occur in Asia (253,000) and Africa (251,000). India has the dubious distinction of having the highest estimated number of

maternal deaths in any country (136,000)¹.

One of the study done in Kolar district, Karnataka explains that Anemia is one of the most common nutritional deficiency disorder. Affecting the pregnant women; the prevalence in developing countries 51% and in India it varies from 65%-75%. The pregnant women were examined².

A cross sectional study carried in Belagavi in Feb-July 2016 amongst 400 pregnant women residing in PHC Handiganur. Study tells that prevalence of Anemia among pregnant woman was found to be 72-75%³.

According to WHO Anemia in pregnancy is defined as a haemoglobin concentration of less than 11gm/dl in venous blood.⁴ The risk factors of anaemia are dietary habits, faulty absorption mechanism and iron loss, excessive blood loss during menstruation, hook – worm infestation, chronic malaria, and chronic blood loss due to bleeding piles. The other factors are increased demand of iron, diminished intake of iron, socio – economic factors, loss of appetite, excessive vomiting in pregnancy, disturbed metabolism, abnormal demands like multiple pregnancy, teenage pregnancies, maternal illiteracy, malnutrition, unemployment, primigravida and multigravida⁵.

Global Data epidemiologists obtained data from studies that collected blood samples from the general populations and tested them for hemoglobin levels. Anemia is defined as having a hemoglobin levels below the thresholds set for specific age groups by the WHO. The figure below presents the total prevalence of anemia in the 16MM. India has the highest total prevalence of anemia at 39.86%, while Canada has the lowest at 3%. The US and 5EU (France, Germany, Italy, Spain, and the UK) have total prevalence levels ranging between 5.6–10.74%, making the disease a common occurrence in these markets⁶.

Objectives:

1. To assess the hemoglobin level of pregnant women.
2. To assess the factors associated with anemia during pregnancy among pregnant women.
3. To determine the association between

extraneous variables and factors associated with anemia among pregnant women.

Hypotheses:

1. **H₁**: There is a significant association between associated factors and level of hemoglobin among pregnant women.
2. **H₂**: There is a significant association between hemoglobin and factors causing Anemia among pregnant women.

Source of Data: Pregnant women from OBG unit of SNMC HSK Hospital Research Centre, Bagalkot.

Research Design: Descriptive cross sectional design was used for this study.

Setting: OBG unit of SNMC HSK Hospital Research Centre, Bagalkot.

Sample: Pregnant women.

Criteria For Selection of Sample:

Inclusive criteria

- Pregnant women who are available at the time of data collection, willing to participate, who know Kannada / English language.

Exclusive criteria

- Pregnant women who are sick and cannot provide data.

Sampling Technique: Convenient sampling technique was used

Sample size: samples Includes 100 pregnant women.

Sample Size Estimation:

The Level of confidence was 95% ($\alpha=5\%$) and $z_{\alpha}=1.96$

The power of test was considered 80%.

The sample size was estimated by statistician was

Considering the attritions of data researcher enrolled 100 subjects.

Method of data collection: Interview schedule was used.

Tools for data collection:

1. Hemoglobin values were taken from the antenatal records of women and structured interview schedule was used to collect data.

Data collection procedure:

Phase I: Formal permission was taken from the principal, BVVS Sajjalashree Institute of Nursing Science Bagalkot, Principal and Dean of S NIjalingappa Medical College, HSK hospital and research centre, Bagalkot to collect the data.

Phase II: Pregnant women were selected on the based on set of inclusion and exclusion criteria and eligible subjects were included in the study.

Phase III: Written informed taken from the subjects.

Phase IV: Modified Tool was administered to the pregnant women by structured interview schedule to assess the factors associated with anemia during pregnancy.

Data management and statistical analysis:

Ø Collected data was managed with MS Excel – 2007 and summarized by descriptive statistics like frequency, percentage, mean, SD. Statistical analysis was done by using SPSS Version 25.

Results

Description of laboratory results

1. Anemic : <10.9gm/dl
2. Non anemic: >10.9 and above

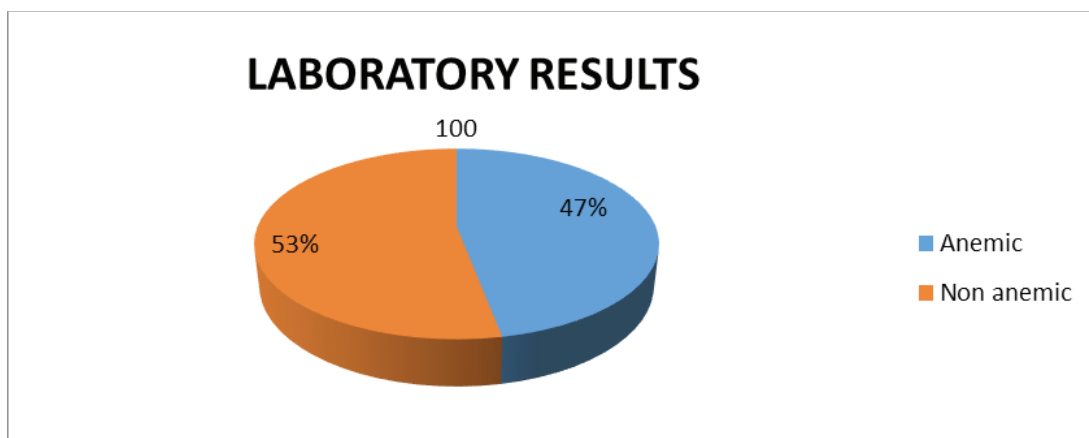


Fig 1: Pie chart showing percentage wise distribution of subjects according to laboratory result of the pregnant women.

Fig 1: Illustrate the percentage wise distribution of samples according to the laboratory results of pregnant women. 47% of pregnant women were anemic and 53% of pregnant women were non anemic in the laboratory results of the present study.

Table No 1. Association between obstetrical factors and anemic status of pregnant women:

N=47+53=100

S. No	Variable	DF	Chi- value	Table value	Remark
1.	Antenatal registration	1	0	3.84	NS
2.	Gravida	3	2.372	7.81	NS
3.	Birth spacing	2	1.81	5.99	NS
4.	Contraceptive use	2	0.0728	3.84	NS

Cont... Table No 1. Association between obstetrical factors and anemic status of pregnant women:

5.	Vaginal Bleeding	1	3.96	3.84	Significant
6.	M.C .duration	3	7.023	7.81	NS
7.	Pad changed/day	1	1.47	5.99	NS
8.	H/O Miscarriage	1	5.523	3.84	Significant
9.	Multiple pregnancy	1	0.0036	3.84	NS
10.	H/O Infertility	1	96.028	3.84	Significant
11.	TT injection	1	0.4301	3.84	NS
12.	Gestational age	2	0.3815	5.99	NS

Chi- square was calculated to find out the association between obstetrical factors and anemic status of pregnant women where the Chi- square calculated value is less than table value for **antenatal registration, gravida, birth spacing, contraceptive use, menstrual cycle duration, no of saturated pads changed per day, history of multiple pregnancy, TT injection received and gestational age in weeks** so there is no significant association found between above characteristics. (Table No 4)

Vaginal bleeding during pregnancy: Calculated value is 3.96 (T. value 3.84) more than the table value which shows that there is significant association between Vaginal bleeding during pregnancy with anemic status of pregnant women.

History of miscarriage: Calculated value is 5.523 (T. value 3.84) more than the table value which shows that there is significant association between history of miscarriage with anemic status of pregnant women.

History of infertility: Calculated value is 96.028 (T. value 3.84) more than the table value which shows that there is significant association between history of infertility with anemic status of pregnant women.

Table No: 2. Association between medical factors and anemic status of subjects.

N=47+53=100

SI.No	Variable	DF	Chi- value	Table value	Remark
1.	Previous Medical Illness	1	0.8323	3.84	NS
2.	Malaria during pregnancy	1	3.9066	3.84	Significant
3.	HIV	1	0	3.84	NS
4.	HBSAG	1	0	3.84	NS

Chi- square was calculated to find out the association between medical factors and anemic status of pregnant women where the Chi- square calculated value is less than table value for **Previous Medical Illness, HIV and HBSAG**, so there is no significant association found

between above characteristics. (Table no 5)

Malaria during pregnancy:

Calculated value is 3.9066 (T. value 3.84) more than the table value which shows that there is significant

association between malaria during pregnancy with anemic status of pregnant women.

Discussion

The present cross sectional study was conducted with the aim of assessing the hemoglobin level and factors associated with anemia among pregnant women. Study includes 100 subjects, selected by using convenient sampling technique.

Findings of the present study on assessment of hemoglobin values were found that 47% were anemic where similar study was conducted by **Peter Anlaakuu & Francis Anto** in their results (40.8%) were anemic; it was almost similar to the result of our study (47%).

In this study Socio-demographic all the factors did not significant associated with anemia except type of family the (chi-square value 4.52) it is more than the (table value 3.84), which shows there is significant association between type of family with anemia of pregnant women. Our study reports are supported with the similar study conducted by **Adumu Kenea** their values are (AOR=2.97, 95%), CI (1.69, 5.27).

In vaginal bleeding during pregnancy the present study findings were 4 (8.51%) where our study reports are similar to the study conducted by **Fikir Asri** their results were 7 (3.4%).

In the present study **history of miscarriage** the calculated value (chi value-5.523, T value -3.84) during pregnancy were found to be significantly associate with anemia during pregnancy. Our study results are supported with study conducted by **Angsom, Gebrewad and Aster Tesegaya** shown that miscarriage is associated with anemia during pregnancy.

In this study **history of Infertility**, the calculated chi square value 96.028 (Table value 3.84). Our study results are supported with study conducted by **Efrem Negash**, shows that infertility is associated with anemia during pregnancy.

In the present study, Malaria during pregnancy the calculated values (chi value 3.966) our study reports are similar to a study conducted by **Peter Anleekuu and Francis Anto** in the year 2017 their results (19.6%) of had Malarial infection during the current pregnancy.

Conclusion:

Anemia is a major public health problem affecting the both developed as well as the developing countries. It can be driven by a certain awareness programme from the government and non government agencies, targeting risk factors is essential in decreasing anemia during pregnancy especially focusing on vaginal bleeding in pregnancy, joint family, infertility, miscarriage, and malaria.

Limitations of the study: The study was confined only to exploration of factors associated with anemia during pregnancy among pregnant women attending OBG unit of SNMC HSK hospital and research centre, Bagalkot.

Ethical Clearance: Formal permission was taken from the principal BVVS Sajjalashree Institute of Nursing Science Bagalkot, and SIONS- Institutional ethics committee on human subjects' research.

Source of Funding: Grant for short term research 2019-20, from Rajiv Gandhi University of Health sciences, Bengaluru, Karnataka.

Conflict of Interest: None

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Gender-Inequity in Eyecare: Variation by Service Level and Location in North India

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Abstract

Background: In the South Asian sub-continent, more than 87% of distance visual impairment is due to avoidable causes. Women bear a disproportionately large burden of the problem.

Objectives: To perform an eyecare program wide analysis of utilization data, disaggregated by sex, age and presenting visual acuity, in order to investigate if utilization varied with gender, and if so at what level of services.

Methods: Retrospective one-year data (July 2016-June 2017), collected as part of a north-Indian eyecare program was analyzed for sex-based differences. It consisted of rural and urban attendance at vision centers and camps at primary level, plus walk-in access and cataract operations at rural secondary, and urban tertiary levels.

Results: At primary and secondary levels in rural areas, significantly fewer women than men accessed vision centers and camps, and received cataract surgery at the secondary hospital, respectively. This trend was reversed in urban areas, both at primary level, and at tertiary hospital. Cataract surgical patients were further stratified by pre-operative visual acuity in better eye, and at both levels significantly more women than men were blind at time of surgery.

Conclusions: Service utilization by women varies significantly and unpredictably within a single eyecare program. Collection and analysis of sex-disaggregated data is needed at all locations and levels of care, to determine inequity and plan interventions.

Keywords: *Cataract; Primary; Rural; Secondary; Tertiary; Urban*

Introduction

Women access formal healthcare less frequently,¹ and at much later stages than men, for most conditions. A rural south Indian study showed similar delays in accessing services for eye conditions, with 89% of women not accessing treatment, despite noticing poor vision, as compared to 29% of men.²

Women have been shown to bear a disproportionately larger share of global visual impairment (VI)³ and blindness.³⁻⁴ Almost two-thirds of people blind from cataract are women and yet cataract surgical coverage (CSC) is higher in men.⁵ This gender-inequity in CSC

is particularly pronounced in India,⁶ and other low and middle-income countries.⁷

Universal eye health cannot be achieved without substantial investment in primary and secondary level services. Over the past decade, our organization has invested heavily in developing a system consisting of a tertiary hospital, secondary hospitals and vision centers (VCs.) as well as in conducting transient screening camps. In last five years, number of people screened at primary level through rural camps and VCs, increased from 35,008 to 92,080 per year, and patients examined at secondary hospitals increased from 45,838 to 94,966 per year. In same time period, surgeries performed at all

secondary hospitals increased from 4,947 to 13,751 per year.

Factors reportedly influencing service uptake by women are lack of awareness, distance, cost, ease of access and dependence on an escort.⁸ While many programs report overall gender-inequity, few publications examine gender-inequity at different levels of an established eyecare program.

The purpose of this study was to perform a program wide analysis of utilization data, disaggregated by sex, age and presenting visual acuity (VA), in order to investigate if utilization varied with gender and if so at what level of services. This would also have practical implications for design of future service-based programs for eyecare, in similar regions.

Method

Retrospective cross-sectional study of sex-specific service utilization data collected between July 2016 and June 2017, at different levels of an eyecare system, of a north Indian community-based organization.

Primary eyecare in the system includes outreach camps (camps) and VCs, in both urban and rural settings. Camps are scheduled activities in community where patients are screened and provided with glasses. Patients requiring surgery are transported to the nearest surgical secondary or tertiary hospital for free. Sex-specific camp data was extracted from camp reports prepared after each camp.

VCs⁹ are permanent facilities that provide primary level eyecare to a population of around 50,000 people. They are based in rural¹⁰ areas at the block headquarters' level and in urban slums, making them accessible by public transport. Services include refraction, diagnosis and treatment of minor eye conditions and referral of surgical cases to the nearest surgical secondary or tertiary hospital. Sex-specific data on VC service utilization was extracted from the VC Management System (VCMS).

Secondary hospital included, is located in a rural area, staffed by full-time ophthalmologists and provides comprehensive eyecare services, including cataract surgery and other surgical services- glaucoma, non-blinding conditions like nasolacrimal duct blockage, pterygium and minor lid conditions. It is accessible by

public transport.

Tertiary facility is located in Delhi and provides all sub-specialty services, as well as training and research activities. For hospitals, sex-specific data was extracted from routine administrative software, the Integrated Hospital Management System (IHMS). Participants were selected using the gender code identified through camp reports, VCMS and IHMS .

Comparisons were made between proportions of male and female patients at all ages, over the age of 50 years (where most eye diseases are concentrated), and at each level and location of care. Comparisons were also made on proportions of male and female patients undergoing cataract surgery with blindness (Snellen VA of less than 3/60 in better eye).¹⁰ This was used as a proxy indicator for delay in accessing services.

Data were analyzed using R software version 3.1.1 and Excel 2013. Proportions were compared using Z-test, and p-value of less than 0.05 was considered statistically significant. The study adheres to the recommendations made in the Declaration of Helsinki.

Results

More women than men attended VCs, but fewer attended camps. Overall, outpatient service utilization by women at primary level (both VCs and camps) was 50.8% (39,235 of 77,236 total patients examined) and hospital outpatient service utilization (both secondary and tertiary level) by women was 46.4% (94,607 of 203,824 patients) (Figure 1).

In rural areas, significantly fewer women than men accessed outreach camps (14,327 of total 29,933; 47.9% [95% CI:47.3%-48.4%; p<0.05]) (Figure 2). Similarly, in rural VCs, significantly fewer women than men accessed services (8526 of 18,561 total patients examined; 45.9% [95% CI:45.2%-46.6%; p<0.05]) (Figure 2).

However, in urban areas, this trend was reversed as significantly more women than men accessed outreach camps (5,158 women of 9,831; 52.5% [95% CI:51.5%-53.4%; p<0.05]) (Figure 2). Similarly, significantly more women than men visited urban VCs (11,244 of 18,911; 59.3% [95% CI:58.6%-60.1%; p<0.05]).

At rural secondary hospital, significantly fewer women than men were paying walk-in patients (13,844 of 31,353; 44.1% [95% CI:43.6%-44.7%; $p < 0.05$]). This trend was also significantly apparent amongst walk-in patients aged 50 years and above, where 6,361 women accessed services, out of a total of 14,256 (44.6% [95% CI:43.8-45.4%; $p < 0.05$]).

In urban hospital, while significantly fewer women attended as paying patients (80,763 of 172,471; 46.8%, [95% CI:46.6%-47.0% $p < 0.05$]), trend reversed in above 50 age-group as more women than men attended the hospital (34,611 of 68,342 patients; 50.6% [95% CI:50.2-51.0; $p < 0.05$]).

In rural hospital, significantly fewer women than men underwent cataract surgery (1,975 out of 4,350; 45.4% [95% CI:43.9-46.9%; $p < 0.05$]). In urban hospital, trend was reversed and significantly more women than men underwent cataract surgery (3,202 of 6,043; 53% [95% CI:51.7-54%; $p < 0.05$]).

At rural hospital, significantly more women than men were blind at time of surgery (17.9% women versus 15.0% men [Risk Ratio:1.22 $p < 0.05$]). This was similar in urban tertiary hospital (7.3% of women versus 5.4% of men blind [RR:1.35 $p < 0.05$])

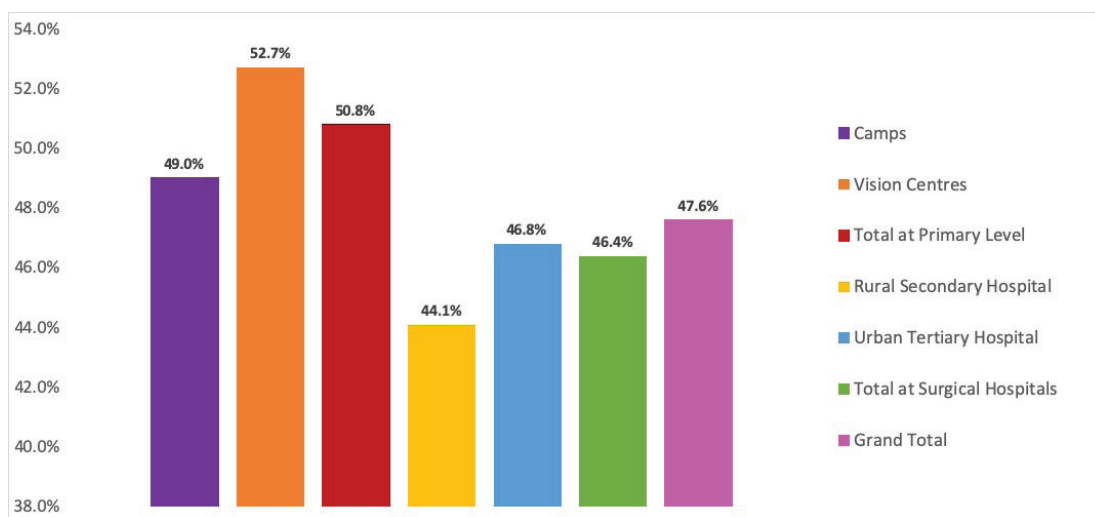


Figure 1: Overall proportion of female outpatients (Column Height) by primary, secondary, and tertiary service level. [Original]

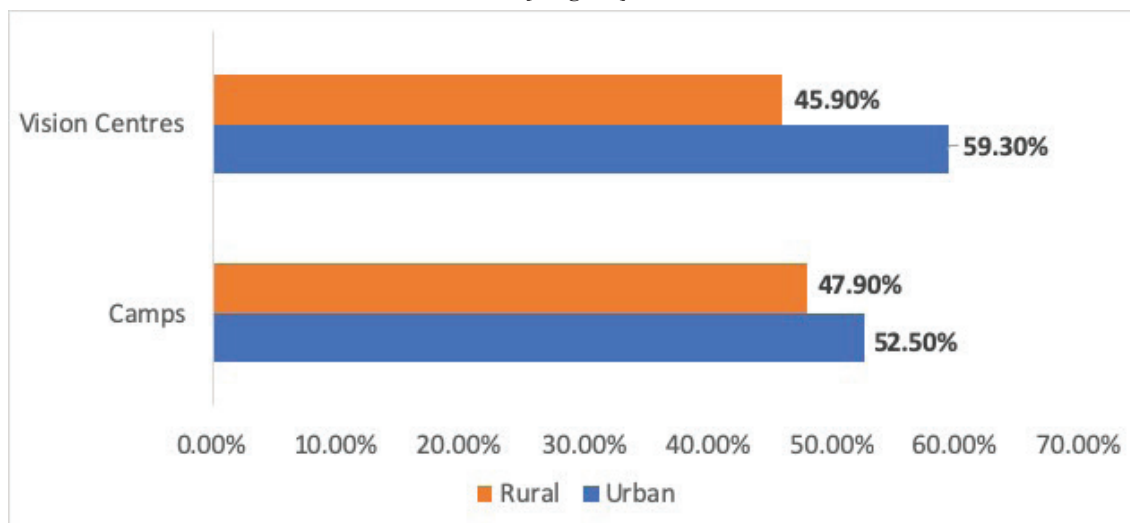


Figure 2: Proportion of women accessing care at primary level (Column Width), by location. [Original]

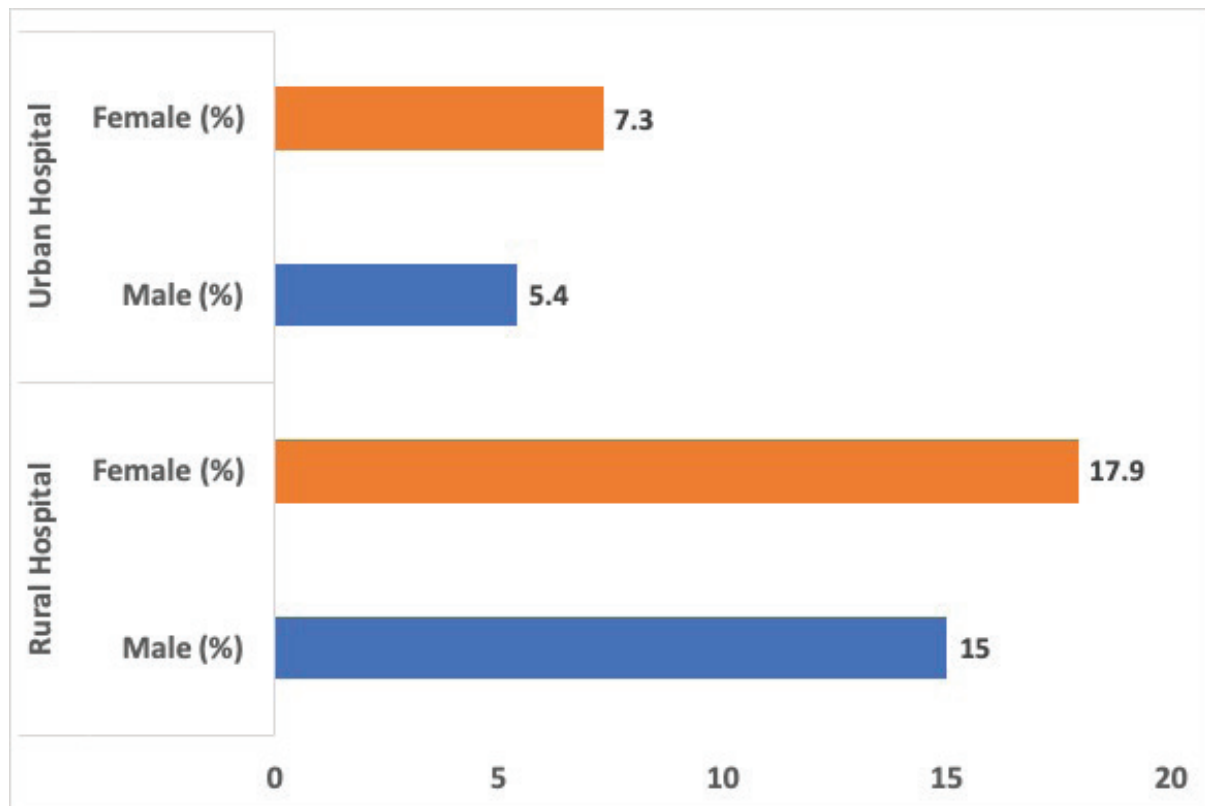


Figure 3: Percentage of men and women operated at urban tertiary and rural secondary hospitals (Column Width), belonging to blind category. [Original]

Discussion

In the past decade, our organization has substantially increased footfall of people treated through its' eyecare program and has improved access for marginalized people in urban slums and rural areas.

Analysis of overall service utilization at primary level (camps and VCs) in both urban and rural settings of the organizational network showed equity for outpatient visits by sex (50.8% women). Similarly, cataract operations performed at urban and rural hospitals combined showed equity (49.8% women). However, disaggregation by location showed that, in rural primary level camps and VCs, a significantly lower proportion of women than men were served. In addition, in rural secondary hospital significantly fewer women than men above the age of 50 years attended, and significantly fewer women than men were operated for cataract.

Lower utilization of services by women in rural areas is seen for a range of health conditions. Women from rural areas in India are 31% less able to access antenatal care, 53% less able to have an institutional delivery and

5% less able to get a maternal tetanus vaccination than women in urban areas.¹¹

Several studies report similar gender-inequity in rural eyecare services. A study in rural south India, from 1999, showed that men were twice as likely as women to attend eye camps.¹² A Nigerian study showed that men were more likely to access primary eyecare than women¹³ while a Ghanaian study reported that a lower proportion of women than men had ever had their eyes examined at any level of care.¹⁴

Organization provisioned services are standard pan-system. Both urban and rural camps provide all services free of cost, while VCs charge only a minimal fee of around Indian Rupees 30 for an examination. Thus, in this context, barriers other than cost and services become relevant.

Outreach camps and VCs are two very different models of primary eyecare service delivery. VCs are fixed facilities providing flexible times for access, while camps deliver transient services at a pre-decided date and time. In our study, proportion of women attending

was greater in VCs than camps, presumably due to flexible hours offered. A similar trend has been reported almost a decade earlier from a high-volume rural Indian eyecare institute.¹⁵

Distance from hospital, loss in wages, transportation and cost² are oft cited barriers to utilization in eyecare. Our network employed strategies to overcome these barriers of distance and cost, including mobile campaigns,¹⁶ to distant rural communities and no-cost VCs for people too poor to pay. However, in rural households, women's total workload is much higher than that of men, including farm activities over and above domestic work, further constraining time for personal chores.¹⁷ In rural areas served by our network, female and male literacy was 57% and 77% respectively, with 83% women and 52% men not employed in organized sectors.¹⁸ Lack of autonomy and low literacy have been shown to negatively influence health-seeking behavior in a neighboring Indian state.¹⁹

Considerable research has examined the cost-effectiveness of different strategies increasing uptake of eyecare services by women. Systematic review of randomized controlled trials undertaken in Bangladesh, India, Malawi, and Nepal recommended women's groups practicing participatory learning and action as a cost-effective strategy in low-resource settings.²⁰ A similar study from 2018 has recommended sensitizing family members, community mobilization, and capacity building of frontline health functionaries. It also highlighted that community-based interventions by eyecare personnel may be required to improve awareness regarding access to care in rural areas.²¹

Lower utilization of cataract services by women in our study's rural hospital is similar to multiple meta-analyses from studies around the world.²² In a rapid assessment of avoidable blindness (RAAB) conducted in rural setting in the same state as the secondary hospital, CSC at vision less than 3/60, was found to be lower among women. In contrast, RAAB carried out in an urban location in the same state showed similar CSC amongst men and women.²³

The highest proportion of cataract, and cataract related blindness and VI is in patients over 50 years of age.³ Among the walk-in patients over the age of 50 years, there were more women. This trend was reversed

in rural hospital, and will require additional focus for future interventions, to increase CSC for women.

Pre-operative VA in the better eye was used as a measure of delay in uptake of surgery. In both the rural secondary and urban tertiary hospital, a higher proportion of operated women than men had blindness, indicating later presentation of women. This is consistent with cataract related blindness being higher amongst women than men in a national survey.²⁴ Delay in seeking surgery needs to be targeted in both the rural and urban settings in our context as later presentation by women was associated with poorer outcome after surgery, as reported in RAAB from many countries.²⁵

A limitation of our study would be its' basis in retrospective data sourced from a single service provider. As data were extracted from software, we don't expect any observer bias. Data from more service providers needs to be collated if regional, sex-specific service utilization trends are to be observed, to enable planning of interventions.

Conclusions

Our results show that while the provision of primary and secondary level of services in rural areas reduces overall population-level inequity, it doesn't ensure gender-equity. Our study highlights the importance of in-depth, system wide, analysis of sex-specific utilization data by service providers as a first step for ensuring gender equity. Prospective studies to understand reasons for inequity in uptake of services at different level of eyecare delivery within a network and relevant interventions are recommended as next steps.

Ethical Clearance: Taken from Institutional Review Board of Dr Shroff's Charity Eye Hospital (IRB/2018/MAY/17).

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Evaluation of Service Quality in a Tertiary Care Hospital Using A Novel Patient Satisfaction Survey Tool in Mysore City, India – A Pilot Study

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Abstract

Understanding patient's perception on hospital service quality will facilitate in improving the outcome of existing health care system while enhancing quality. Literature assessing service quality of a multispecialty hospital in this region was scanty. This pilot study assessed service quality & patient satisfaction in a multispecialty tertiary hospital catering to healthcare needs of population in Mysore district using a modified service quality assessment tool. TerHosQual (Tertiary Hospital Quality) assessment tool was developed by synthesising the inputs of experts and literature review and validated by twelve subject experts. Tool was pilot tested on thirty participants selected using stratified random sampling. Analysis revealed that all participants answered all items in the tool with no gender and age differences in most of the thirteen dimensions. Dimension 3 (Overall services) and 4 (Discharge) significantly added to prediction of customer loyalty.

Key words: Service quality, Tertiary hospital,

Introduction

A long & healthy life is a vital dimension of the human development. Health care delivery is largely contributed by private sector in India.¹ There has been an increasing interest as well as concerns on the quality of services rendered by hospitals as standards of living changed. Service quality has become increasingly important for hospitals in their efforts of satisfying & retaining patients². Meehanet.al (2002)³ highlighted that understanding patient's perception on hospital service quality will facilitate in improving the outcome of existing health care system while enhancing quality. According to Duggirala et.al (2008)⁴ hospital service quality in developing countries consists of

seven dimensions, (personnel quality, infrastructure, administrative process, process of clinical care, safety, over all experience of medical care & social responsibility). Aagja & Garg (2010)¹ developed public hospital service quality (PubHosQual) based on five dimensions (Admission, medical service, overall service, discharge process & social responsibility). Oliver (1997)⁵ noted that satisfaction is a general psychological state which is about the expectation for emotions & experience from shopping behavior. Kim et al. (2008)⁶ adopted the concept of customer satisfaction & defined that patients satisfaction is the judgment of perceived value and sustained response toward service related stimulus before, during or after the consumption of medical services by a patient.

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Patient satisfaction is concerned with degree to which the expectations of a patient are fulfilled by the medical services.⁷ For hospitals, satisfied patients

are important as they are more likely to use medical services, follow prescribed treatment plan, and maintain relationship with a specific health care provider and recommend the hospital to others.⁸ Literature assessing service quality of a multispecialty hospital in this region is scanty. In this background, the present pilot study was undertaken to assess service quality in a tertiary care multispecialty hospital in Mysore district using a modified service quality assessment tool.

Materials and Method

Study design and setting: This cross sectional questionnaire study was conducted in Feb 2020 among 30 patients admitted and treated in a tertiary care hospital in Mysore city. Data was obtained from in patients admitted in general wards of medicine and surgery units in a tertiary care hospital. Ethical clearance was obtained from IEC.

Recruitment of study participants:

Participants with following eligibility criteria were initially identified

Inclusion criteria: Inpatients

- ü With admission for a minimum duration of 48 hours
- ü Should have undergone clinical consult
- ü Should have been exposed to invasive and non-invasive diagnostic procedures
- ü Should have encountered nursing facilities
- ü Should have availed pharmacy
- ü Should have undergone discharge process

Exclusion criteria:

- ü Pediatric patients
- ü Patients in Intensive Care Unit
- ü Patients under observation
- ü Patient undergoing Discharge against medical advice (DAMA)

Permission and consent: Permission was obtained from concerned hospital authorities besides obtaining

informed consent from all eligible participants after explaining research protocol.

Selection of participants: A stratified random sampling technique was used for selection of study participants. List of eligible patients in general medicine and general surgery ward was prepared. Eligible participants were segregated into males and females groups. Participants in each group of males and females were again segregated into two subgroups based on age (those aged less than 30 years and those aged 30 years and more). Numbers were assigned for participants in each of these four sub groups. Required number of participants from each subgroup was selected using simple random sampling.

Development and validation of tool:⁹ Tool for service quality evaluation was developed by synthesizing inputs from three subject experts and literature review. An initial tool consisting of 72 items was drafted. Data validation template was developed by highlighting background for development of this new tool and seventy two items were grouped under 13 different dimensions. Based on expert validation, 21 items were removed from initial questionnaire. 8 items were removed due to lack of relevance, 6 items due to lack of appropriateness, 3 items due to lack of clarity of words and 4 items due to redundancy. Final questionnaire had 51 items under 13 different dimensions. Cognitive interview was conducted among ten prospective participants selected from the hospital to assess response process validity. Retrospective verbal probing was adopted to elicit whether participants are able to interpret each item in the tool according to what investigators would have wanted them to interpret (response process validity). Minor modifications in wording of three items were done based on suggestions by these participants. All subject experts subsequently expressed consensus for this modifications in wordings for three items. Reliability of the questionnaire was assessed using test-retest method on 10 patients selected before undertaking the data collection for pilot study. The tool was found to be reliable with Cronbach's alpha value of 0.93. The tool was named TerHosQual (Tertiary Hospital Quality) assessment tool.

Data collection: Information on service quality was collected using this new tool through personal interview

by a trained and calibrated investigator. Each participant chose one score on a Likert scale for each item in the questionnaire (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree).

Statistical Analysis

Data analysis was done using SPSS Version 24 (IBM, Chicago, USA). Comparison of mean dimension scores in relation to gender and age groups was done using independent sample t-test. Considering customer loyalty (dimension 13) as a dependent variable, we evaluated relationship between this and other variables in the scale. A simple linear regression analysis was carried out to predict customer loyalty using other 12 dimensions as predictor variables.

Results

A total of thirty participants participated in this pilot study. Distribution of participants in relation to age and gender is denoted in table 1. Comparison of mean score between males and females in each dimension is

presented in table 2. There was no significant difference in the mean score of various dimensions between males and females ($p > 0.05$) except for dimension 2 (medical services), dimension 6 (staff conduct) and dimension 9 (Continuity) where mean scores were significantly higher among males compared to females. Comparison of mean score in relation to age groups in each dimension is presented in table 3. There was no statistically significant difference in the mean score of any dimension between participants in two age groups ($p > 0.05$). A correlation between customer loyalty and other dimensions was statistically significant ($p < 0.05$, table 4) except for discharge (dimension 4) and communication (dimension 10). A multiple regression was run to predict customer loyalty (dimension 13) using other dimensions as independent variables (table 5). These variables statistically significantly predicted customer loyalty, $F(12, 16) = 7.084$, $p < .001$, $R^2 = 0.842$. Dimension 3 (Overall services) and 4 (Discharge) significantly added to prediction, $p < 0.05$.

Table 1: Demographic details of study participants

Age groups	Males N (%)	Females N (%)	Total N (%)
Less than 30 years	9 (56.2)	7 (43.8)	16 (100)
30 years or more	7 (50)	7 (50)	14 (100)
Total	16 (53.3)	14 (46.7)	30 (100)
Statistical inference	X2 Value: 0.117 p value: 0.732		

Table 2: Comparison of mean scores in different dimensions between males and females

Dimension	Males Mean \pm SD	Females Mean \pm SD	Total Mean \pm SD	Statistical inference
Dimension 1 (Admission)	11.8 \pm 1.8	10.6 \pm 4.8	11.3 \pm 3.5	t-value: .904 p value: .373
Dimension 2 (Medical services)	13.3 \pm 1.6	12.0 \pm 1.4	12.7 \pm 1.6	t-value: 2.277 p value:.031
Dimension 3 (Overall Services)	19.8 \pm 4.0	16.9 \pm 4.3	18.4 \pm 4.3	t-value: 1.870 p value:.072

Cont... Table 2: Comparison of mean scores in different dimensions between males and females

Dimension 4 (Discharge)	11.3±1.1	8.9±4.8	10.2±3.6	t-value: 1.969 p value: .059
Dimension 5 (Social responsibility)	8.0±1.9	6.2±3.2	7.2±2.7	t-value: 1.902 p value: .068
Dimension 6 (Staff conduct)	33.5±3.5	29.6±5.1	31.7±4.7	t-value: 2.483 p value: .019
Dimension 7 (Service Quality & Service availability)	35.0±3.2	30.3±9.0	32.8±6.9	t-value: 1.952 p value: .061
Dimension 8 (Confidence)	8.1±1.8	7.2±0.7	7.7±1.5	t-value: 1.758 p value: .090
Dimension 9 (Continuity)	8.5±1.4	6.7±1.7	7.7±1.8	t-value: 3.112 p value: .004
Dimension 10 (Communication)	12.0±0.6	11.1±2.5	11.6±1.8	t-value: 1.323 p value: .196
Dimension 11 (Conducive environment)	15.1±2.1	15.9±3.1	15.4±2.7	t-value: -.870 p value: .392
Dimension 12 (Health care costs)	10.9±1.3	9.7±2.2	10.3±1.8	t-value: 1.803 p value: .082
Dimension 13 (Customer loyalty)	15.9±2.4	14.9±2.1	15.4±2.3	t-value: 1.122 p value: .271

Table 3: Comparison of mean scores in different dimensions between participants in different age groups

Dimension	Less than 30 years Mean ± SD	30 years and more Mean ± SD	Total Mean ± SD	Statistical inference
Dimension 1 (Admission)	10.9 ± 3.6	11.6 ± 3.5	11.3±3.5	t-value: -.540 p value: .593
Dimension 2 (Medical services)	12.6±1.9	12.7 ± 1.3	12.7±1.6	t-value: -.149 p value: .882
Dimension 3 (Overall Services)	19.2±2.6	17.6±5.7	18.4±4.3	t-value: 1.029 p value: .312
Dimension 4 (Discharge)	10.1±4.0	10.3±3.1	10.2±3.6	t-value: -.168 p value: .868
Dimension 5 (Social responsibility)	7.5±2.6	6.8±2.8	7.2±2.7	t-value: .722 p value: .476

Cont... Table 3: Comparison of mean scores in different dimensions between participants in different age groups

Dimension 6 (Staff conduct)	31.1±5.6	32.3±3.4	31.7±4.7	t-value: -.669 p value:.509
Dimension 7 (Service Quality & Service availability)	32.3±7.3	33.4±6.7	32.8±6.9	t-value: -.407 p value:.687
Dimension 8 (Confidence)	7.9±1.4	7.5±1.6	7.7±1.5	t-value: .693 p value:.494
Dimension 9 (Continuity)	7.8±2.0	7.5±1.6	7.7±1.8	t-value: -.471 p value:.641
Dimension 10 (Communication)	11.7±1.4	11.5±2.2	11.6±1.8	t-value: .281 p value: .781
Dimension 11 (Conducive environment)	15.4±2.9	15.6±2.4	15.4±2.7	t-value: -.238 p value:.813
Dimension 12 (Health care costs)	10.2±2.3	10.5±1.1	10.3±1.8	t-value: -.461 p value:.648
Dimension 13 (Customer loyalty)	15.8±2.0	15.1±2.7	15.4±2.3	t-value: .796 p value:.433

Table 4: Correlation between customer loyalty (dimension 13) and other dimensions in the assessment tool.

	Admission	Medical services	Overall Services	Discharge	Social responsibility	Staff conduct
Customer Loyalty (r value)	0.427	0.494	0.634	0.101	0.570	0.567
p value	0.01	0.003	0.000	0.301	0.001	0.001
	Service Quality & Service availability	Confidence	Continuity	Communication	Hospital environment	Health care costs
Customer Loyalty (r value)	0.509	0.388	0.453	-0.219	0.380	0.464
p value	0.002	0.019	0.007	0.127	0.021	0.006

Table 5: Model summary of regression analysis

Model	Un standardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t value	p value
(Constant)	6.899	5.219		1.322	.205
Dimension_1	.201	.157	.307	1.286	.217
Dimension_2	.393	.205	.272	1.916	.073
Dimension_3	.385	.093	.714	4.147	.001
Dimension_4	-.563	.190	-.869	-2.958	.009
Dimension_5	.039	.170	.046	.232	.820
Dimension_7	.141	.104	.419	1.352	.195
Dimension_8	.130	.247	.082	.525	.607
Dimension_9	.277	.399	.214	.695	.497
Dimension_10	-.401	.318	-.311	-1.261	.225
Dimension_11	-.142	.165	-.160	-.860	.402
Dimension_12	-.221	.305	-.174	-.724	.480

Ethical Clearance: Obtained from IEC, JSSDCH.

Source of Funding- Self

Conflict of Interest – Nil

Discussion

Measuring of service quality in a hospital is a difficult task. Patient services are intangible, heterogeneous and are not easily separable. Quality ought to be seen as manifested and felt as expected. Hospital has two types of quality; technical quality-“what patients get”, functional quality-“how they get it”. In other words, technical quality is the level of accuracy of the diagnosis and procedures while functional quality is the manner in which the services are delivered. SERVQUAL with ten elements essential for customer’s evaluation measures the gap between perception and expectations of the patients and this is considered to be yardstick for judging the quality of a hospital.¹⁰

Many authors have critically appraised the significance of this model in eliciting service quality. Cronin and Taylor (1992), have argued that the assessment of service quality on basis of gap between expectations and performance by SERVQUAL model is not adequate. Kang and James (2004) have indicated that the tool emphasize more on service delivery process than other aspects like technical dimension. Orwing *et al.* (1997) have suggested that these dimensions represent only one factor rather than five.¹⁰ In this background, we developed a tool by incorporating most important dimensions in different tools for assessing service quality of a tertiary care hospital along with inputs from subject experts. This novel tool called as “TerHosQual” included 13 dimensions which were considered to be important from the perspective of service quality assessment. Scale was validated and pilot tested to assess the feasibility of applying tool. We found most patients have positively responded indicating a satisfactory score for almost all items under thirteen dimensions. Response rate for all the items was 100%. We found no significant difference

in mean score in most dimensions in relation to gender. However, female participants expressed less satisfaction with respect to dimension 2 (medical services), dimension 6 (staff conduct) and dimension 9 (Continuity). A study by Woods et al (2003)¹¹ found that women expressed significantly less satisfaction compared to men with regard to nursing care, entire staff care, and overall satisfaction similar to the results of present study. Socio-cultural differences between males and females in terms of their attitude, beliefs, expectations and perceptions may be attributed to this difference in the rating of males and females with regard to these dimensions. Another study by Bener and Ghuloum (2013)¹² also found males to be more satisfied with treatment of Psychiatrists in their study compared to females similar to our findings. Lack of significant difference in relation to gender and age groups with regard to other dimensions was similar to the results of studies by Laroche et al (2005)¹³.

Correlation analysis found significant relationship between customer loyalty and other dimensions except for discharge (dimension 4) and communication (dimension 10). Here customer loyalty was considered as dependent variable as customer loyalty was assumed to be dependent and influenced by all other dimensions included in our tool. Among all these dimensions, dimension 3 (Overall services) and 4 (Discharge) significantly added to prediction of customer loyalty. This was similar to results of studies by Meesala A et al (2014)¹⁴.

Conclusion

Among the thirteen dimensions, Dimension 3 (Overall services) and 4 (Discharge) significantly added to prediction of customer loyalty although there was a significant correlation between customer loyalty and other dimensions.

Novelty: Development of a new tool incorporating all possible dimensions that may influence the quality of service.

Limitations: Factor analysis was not possible owing to small sample size in the pilot study. Factors such as educational status, family income, type of wards could have contributed significantly in predicting the customer loyalty. These were not included in the regression analysis. Social desirability bias cannot be ruled out as

the completion of survey was done by an interviewer.

Way forward: Study with larger sample size where factor analysis would enable us to identify important dimensions that contribute significantly to customer loyalty and patient satisfaction is essential to validate the results of present study.

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Glycosylated Hemoglobin in Early Pregnancy as a Marker to Predict Gestational Diabetes Mellitus – A Prospective Cohort Study

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Abstract

Objective: To study the usefulness of glycosylated hemoglobin in early pregnancy to predict gestational diabetes mellitus.

Material and Methods: We conducted this prospective hospital-based observational study over 30 months. After obtaining university ethics committee clearance, glycosylated hemoglobin (HbA1c) test was performed during the booking visit in the first trimester amongst 284 antenatal women attending our hospital. This was followed by the universal screening with 75g OGTT for all antenatal women during 24-28 weeks. Gestational diabetes mellitus (GDM) was diagnosed based on International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria, and treatment started accordingly. Sensitivity and specificity for prediction of GDM using HbA1c were calculated based on the receiver operating characteristic (ROC) curve.

Results: 70 of the 284 antenatal women were diagnosed with GDM based on IADPSG criteria. The area under the curve for using HbA1c in early pregnancy to predict GDM was 0.712. A cut-off of 5.55 for HbA1c gave a sensitivity of 55.7% (95% CI 49.9, 61.4), specificity 83.6% (95% CI 79.3, 87.9), positive predictive value (PPV) of 41.5% (95% CI 35.8, 47.2) and negative predictive value (NPV) of 83.7% (95% CI 79.4, 88.0).

Conclusion: HbA1c in early pregnancy may be a useful marker in prediction of GDM. A cut-off of >5.55% may warrant an early OGTT for diagnosis and treatment of early-onset GDM.

Keywords: Glycosylated hemoglobin, HbA1c, OGTT, GDM prediction

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Background

The prevalence of diabetes mellitus and prediabetes in India is 4.6% and 14% in urban areas, and 1.7% and 13.2% in rural areas ^{1,2} and that of gestational diabetes mellitus (GDM) is 0-41.9% depending on the criteria used for diagnosis of GDM respectively ³. Universal screening of GDM is recommended in India using a 75-g one-step glucose tolerance test at 24-28wks gestation ^{4,5}. Indian women are recognized to be at high

risk for development of GDM, and HbA1c may be used for screening and diagnosis of this condition being the weighted average of glucose concentration over the last 2-3 months⁶. Diabetes in pregnancy could be due to previously undiagnosed overt diabetes mellitus (DM) or a new-onset carbohydrate intolerance developed for the first time during pregnancy. First-trimester (FT) HbA1c is the ideal time for investigating for both these conditions along with single-step glucose challenge test⁷ in countries like India.

There is a need to recognize overt DM and early-onset GDM to initiate treatment and avoid potential complications of diabetes during pregnancy⁸. HbA1c is easily measurable, has the advantage of diagnosing overt DM⁹ and also identifying those at high risk for adverse pregnancy outcome when value $>5.9\%$ ^{10,11}. Hence it is included in prenatal panel of high-risk populations¹² in first trimester¹³ and sometimes even in third trimester¹⁴. Though the study by Sevket et al. concluded that HbA1c was not useful¹⁵ in the diagnosis of GDM and OGTT cannot be done away with, we believe that with higher HbA1c values, OGTT can be done early in pregnancy itself - during the first antenatal booking visit - instead of 24-28weeks gestation. Lifestyle modifications with diet and exercise can then be initiated and potential complications of diabetes in pregnancy prevented. Hence, we conducted this study to ascertain the predictability of GDM using FT HbA1c.

Material and Method

This was a prospective hospital-based observational study done over 30 months amongst antenatal women registered in Dr. TMAPai Hospital, Udupi, from first trimester. Anticipating sensitivity of 60%, 3% precision, 5.28% prevalence of GDM during earlier years, with 95% confidence the sample size required was 260. For 20% drop out, 330 had to be recruited. After obtaining IEC clearance, HbA1c was performed in 330 pregnant women. FT antenatal women registered in our hospital with singleton pregnancy were included. Those with diagnosed pre-existing diabetes and multifetal pregnancy were excluded. HbA1c was done in FT followed by a universal screening of GDM at 24-28wks gestation.

Blood samples were analyzed on Cobas C 311 (Roche/Hitachi Cobas C Systems) using the TINIA (turbidimetric inhibition immunoassay) method for

HbA1c. 75g OGTT was done at 24-28weeks gestation and GDM was diagnosed using the International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria of fasting glucose >92 mg/dL [5.1 mmol/L], 1 h >180 mg/dL [10.0 mmol/L], or 2 h >153 mg/dL [8.5 mmol/L]. All pregnant women received standard antenatal care and treatment for GDM was started after a confirmed diagnosis of the same. Sensitivity and specificity for prediction of GDM were calculated based on the ROC curve using SPSSv18.

Results

330 antenatal women were recruited at the initial booking visit. We excluded 46 women from analysis due to early pregnancy wastage or loss to follow-up. Data of 284 pregnant women were analyzed.

70 GDM cases and 214 controls were identified. Data were summarized using percentages for categorical variables and mean and standard deviation for continuous variables. Associations were assessed using chi-square test. Cut-off for HbA1c was obtained using receiver operating characteristic (ROC) curve analysis. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and area-under-the-curve (AUC) were reported. Statistical analysis was performed using SPSS version 18 (SPSS South Asia Bangalore).

Prevalence of GDM was 24.6%. Among these, 57.14% were treated with medical nutritional therapy (MNT) while 42.86% of GDM patients required insulin and MNT for control. 57 (81.4%) were diagnosed with GDM <28 weeks and 13 (18.6%) >28 weeks.

Baseline characteristics of the study participants are shown in table 1. GDM cases were slightly older as compared to controls. There was no significant difference in the parity of women with and without GDM. Higher BMI and strong family history of diabetes mellitus predisposed to GDM and may have contributed to higher FT HbA1c. The mean (+ SD) of HbA1c in our study population is shown in table 2. Mean+SD HbA1c in GDM women on MNT was $5.49+0.66$. and $5.93+0.64$ in those requiring insulin.

The AUC for HbA1c in early pregnancy to predict GDM was 0.712 as depicted in ROC curve (figure 1).

Table 3 shows validity of HbA1c to predict GDM at various cut-off points. At 5.55%, sensitivity was 55.7% and specificity 83.6%. The specificity increased to 96.3% when cut-off was 6.05%. The NPV was 87.2% when cut-off was 5.05%. Most pregnant women developed GDM when HbA1c was > 6% and those < 5% did not develop GDM. Odds ratio for developing GDM using cut-off of 5.5% HbA1c was 2.54 (95%CI 1.7, 3.8) in our study.

There was no statistically significant difference in mean birthweight with GDM and controls. This was

probably because GDM cases were treated with MNT and/or insulin and were well controlled. Though there were more vaginal births in controls, there was no statistically significant difference in the mode of delivery between the groups. Women in both groups delivered at term, but there were more induced labors in those with GDM. There were 2 cases of shoulder dystocia in the GDM group and one in the control group. There were no stillbirths in study group. With strict glycemic control, complications of GDM were reduced to that of controls. These data are depicted in table 4.

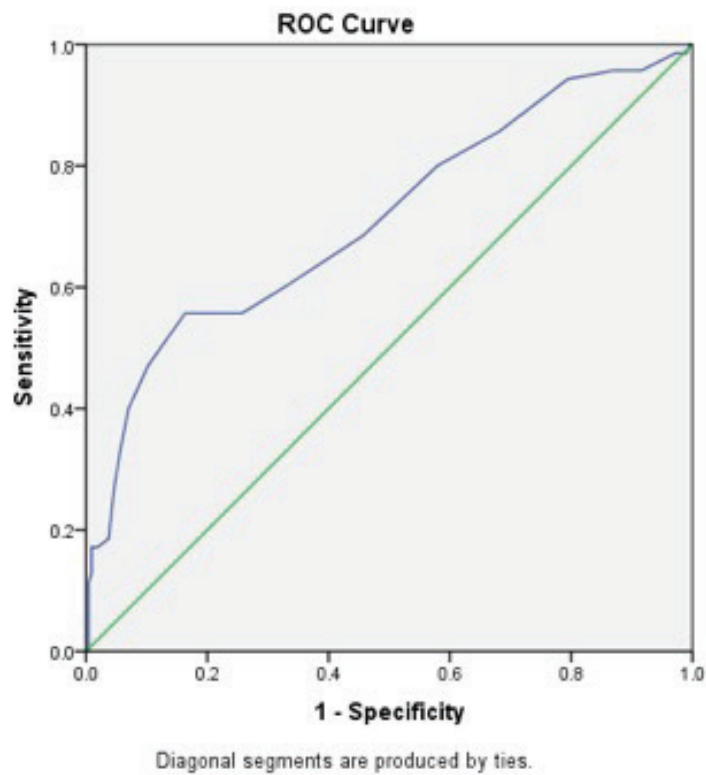


Figure 1: Diagram showing area under the curve using HbA1c to predict GDM

Table 1: Baseline characteristics of the study population

Characteristics	GDM Cases (n=70)	Controls (n=214)	p-value
Mean Age (yr)	29.5+3.6	27.5+3.9	<0.001
Multiparity (%)	38	43	0.46
Family history of T2DM (%)	25	13.2	0.02
Mean BMI + SD	27.6 + 4.3	21.1 + 3.7	<0.001
Mean HbA1c + SD	5.68 + 0.69	5.25 + 0.38	<0.001

Table 2: Mean HbA1c in the study groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
HbA1c	Cases	70	5.679	0.6871	0.0821
	Controls	214	5.247	0.4830	0.0330

Table 3: Validity of HbA1c at various cut-off values

HbA1c Cut-off (%)	Sensitivity	Specificity	PPV	NPV
5.05	85.7 (81.6, 89.8)	31.8 (26.4, 37.2)	29.1 (23.8, 34.4)	87.2 (83.3, 91.1)
5.55	55.7 (49.9, 61.4)	83.6 (79.3, 87.9)	41.5 (35.8, 47.2)	83.7 (79.4, 88.0)
6.05	18.6 (14.1, 23.1)	96.3 (94.1, 98.5)	65.5 (60.0, 71.0)	80.0 (75.3, 84.7)

Table 4: Intrapartum descriptives in the study population

Parameters	GDM Cases (n=70)	Controls (n=214)	p value
Mean + SD Birth weight (gm)	2998.4 + 414.8	2984.6 + 440	0.82
Vaginal delivery (%)	44.3	54.1	0.16
Mean + SD Gestational age at delivery (wk)	37.8+ 1.25	38.5+ 1.06	<0.001

Discussion

The prevalence of GDM was high in our study, probably due to IADPSG criteria for diagnosis³. There was no significance of age or parity in our study. However, BMI was higher in GDM group than in controls. Likewise, HbA1c in early pregnancy was higher in those who developed GDM than in controls. Maternal obesity coupled with family history of diabetes showed higher FT HbA1c with a predisposition to develop GDM subsequently, than in women without these risk factors. GDM women requiring insulin had higher HbA1c than those on diet only. However, there were more antenatal women on MNT than on insulin. Therefore, HbA1c is an ideal screening tool to be included in prenatal panel. It would be prudent to perform a 75gOGTT if HbA1c

is >5.55% to diagnose early-onset GDM and start treatment. If first trimester OGTT is not indicative of GDM, it could be repeated at 24-28weeks. But HbA1c >5.15% with 80% sensitivity would call for vigilance and repeat OGTT at 24weeks and 34weeks.

In the study by Benaiges et al.¹⁶, 13.1% had GDM, and for a rule-in value of 5.6% HbA1c, specificity was 89.3% (95%CI 87.4-91.2), sensitivity was 32.9% (95%CI 25.4-40.4) and PPV was 31.6% (95%CI 24.4-38.9). For a rule-out threshold for HbA1c of 4.8%, NPV was 95.3% (95%CI 91.3-99.3). In our study too, with 5.55% HbA1c, specificity was 83.6% (95% CI 79.-87.9), and PPV was 41.5% (95%CI 35.8 – 47.2). With a reduced threshold <5.05%, NPV increased to 87.2% (95%CI 83.3 -91.1).

Amylidi et al.¹⁷ observed that women with high-risk factors for GDM had higher FT HbA1c [$5.43 \pm 0.31\%$ vs. $5.23 \pm 0.28\%$; $p = 0.0026$]. They also observed that HbA1c $>6\%$ developed GDM and HbA1c values $<4.5\%$ never developed GDM. We also found that most antenatal women with HbA1c $>5.9\%$ developed GDM and those $<4.6\%$ did not.

In another large study on 16,122 antenatal women at a median 47 days' gestation by Hughes et al., HbA1c $\geq 5.9\%$ identified all diabetic women. The PPV was 52.9% at HbA1c $\geq 5.9\%$ which was 98.4% (95% CI 97-99.9%) specific for GDM < 20 weeks. Women with HbA1c of 5.9-6.4% had a higher risk of major congenital anomaly, preeclampsia, shoulder dystocia and perinatal death. They concluded that HbA1c was an early predictor of GDM and could be easily performed as opposed to OGTT¹¹. In our study, we did not observe a higher risk of major congenital anomalies in the GDM group, and there were no perinatal deaths too.

Khalafallah et al. studied 480 pregnant women and found that 11.9% had GDM. At 5.1% cut-off value for HbA1c, sensitivity was 61%, and specificity was 68% with negative predictive value was 93%. But with HbA1c cut-off value of 5.4%, sensitivity was 27%, specificity of 95% and NPV was 91%. They suggested that evaluation with OGTT selectively in pregnant women with HbA1c $\geq 5.4\%$, alleviating the burden of testing for all women¹⁸. Based on the results of our study, we suggest an early 75g OGTT if HbA1c is $> 5.55\%$ and if normal, to repeat the 75g OGTT at 24-28weeks as Indians are more predisposed to develop GDM.

In a prospective study by Wu et al. on 690 pregnant women, HbA1c and hematocrit at 12-16 weeks were followed by a 75-g OGTT at 24-28weeks, and GDM was diagnosed in 107 women. At a HbA1c $< 4.55\%$, sensitivity was 85.0% and specificity 17.3%. With HbA1c $\geq 5.25\%$, specificity increased to 96.6%, but sensitivity decreased to 13.3%. The AUC for GDM detection using HbA1c alone was 0.563 (95%CI, 0.50-0.625) and increased to 0.604 (95%CI, 0.509, 0.701) with a combination of HbA1c and hematocrit. The usefulness of this combination to predict GDM, however, needs to be explored¹⁹. In our study, using HbA1c alone, the AUC was 0.712, and with a cut-off of 5.55%, specificity was 83.6%, and PPV was 41.5%.

In a multicentric study by Stephanie et al using HbA1c at 8-13weeks gestation, GDM cases had 5.3% HbA1c and showed an adjusted 22% higher risk of GDM with each 0.1% rise in FT HbA1c. They inferred this phenomenon could be due to compromised glucose metabolism periconceptionally itself¹³. Similarly, Zi et al showed 82% sensitivity, 72% specificity, 97% NPV and 27% PPV to predict GDM with 5.2% HbA1c at 14 weeks²⁰. Mid-trimester HbA1c levels were also higher in GDM women as compared to non GDM women²¹. In a study on Asian Indian women, the adjusted odds of developing GDM was 1.6 when FT HbA1c was 5.2-5.5% and rose to 2.6 when it was $>5.6\%$ ²².

FT HbA1c is a promising marker for hyperglycemia without additional and intentional glucose load among high-risk pregnant population prone to develop GDM and reluctant to undergo OGTT⁹. With studies showing early interventions using lifestyle modifications when HbA1c $>5.9\%$ could result in lesser preeclampsia, preterm deliveries and NICU admissions¹⁰, we believe that FT HbA1c should be included in early prenatal screening panel. As safety of metformin during pregnancy is established, its use in early GDM also needs to be considered.

This is the first study in this region using HbA1c to predict GDM. Limitations were the small sample size and lack of correlation of HbA1c with early pregnancy wastage.

Conclusion

With increasing epidemic of diabetes in India, HbA1c in early pregnancy is a useful marker in diagnosing overt diabetes and prediction of GDM. A cut-off of $>5.55\%$ may warrant an early OGTT for diagnosis and treatment of early-onset GDM. However, incorporation and standardization of FT HbA1c as a single, non-fasting, screening tool to predict GDM in our country and reduce maternal and perinatal complications requires larger multicentric studies.

Conflict of Interest and Funding : None

Acknowledgements: Nil

Institutional Ethics Committee clearance taken(MU/TMAPHU/13)

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Sperm Parameters and Modifiable Risk Factors in Infertile Males: An Interventional Study

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Abstract

Background: Trends of decline in fertility have been observed with emerging lifestyle factors, with large voids in research on male fertility in India. Hence, this study was conducted to find the association between sperm parameters and modifiable risk factors in infertile males.

Method: An interventional study was conducted among consenting infertile males attending the outpatient Gynaecology department at Tertiary care centre from 2017-2019. Estimated sample size (n=50), after conducting pilot study. Data collection was done with a standard proforma. Risk factors were assessed using AUDIT, WHO classification of weight status, and perceived stress scale questionnaire; smoking was analysed by questions related to smoking. Intervention was in the form of counselling and instructions and follow up was done at 3 and 6 months. Data was analysed using R software v 3.6.0. Chi square test used to find association, (P<0.05). Mann Whitney test and Friedman's ANOVA were used to find difference between variables, (P<0.05).

Results: Mean age of males was 31.22 years with mean body mass index of 23.19 ± 4.14 kg/m². Association was not observed between semen parameters and obesity, alcohol and stress (P>0.05). Association was seen between smoking and semen PH (P=0.003). Significant association was also found between semen volume and presence of more than two risk factors (P=0.0374). Intervention was found to be effective as observed with improved semen parameters at different checkpoints.

Conclusion: Lifestyle associated factors as well as deleterious habits have detrimental effect on reproductive potential. Effectiveness of interventions can help clinicians design patient-oriented strategies.

Keywords: Body Mass Index, counselling, obesity, semen analysis, habits

Introduction

Infertility in adult males can be affected by many lifestyle factors.^{1,2,3} It affects around 8-12% of couples

globally.⁴ According to the World Health Organization (WHO), estimated primary infertility in India is between 3.9% to 16.8%. Prevalence of infertility in Maharashtra is 3.7%.⁵

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Lifestyle associated factors affecting fertility include obesity, alcohol consumption, smoking and stress. Various studies have shown up to a threefold higher prevalence of obesity in infertile males.^{3,6} Reviews further suggest that smoking, alcohol consumption, and psychological stress are risk factors for poor semen

quality.^{7,8}

There are a few scattered reports of declining semen parameters in India.^{9,10,11} The present study attempts to enhance the available research on male fertility in India. It was undertaken to study abnormality of semen sample, to study the association between sperm parameters and modifiable risk factors, and to provide appropriate intervention to male partners of infertile couples.

Material and Methods

The Interventional study was conducted among infertile males attending tertiary care hospital, Kolhapur, between September 2017 and September 2019. Institutional Ethics Committee approval was obtained prior to the study. Infertile male patients scheduled to undergo semen analysis and willing to participate in the study were included after obtaining written informed consent. Patients routinely exposed to radiation, suffering from genetic diseases, malignancies, varicocele, systemic diseases affecting fertility, and those who had undergone surgical procedures on the testis were all excluded from the study.

A pilot study was conducted on 20 patients and it was found that 75% of patients had concentration <15million/ml. Using this prevalence, with 95% confidence interval and 12.5% absolute error, the calculated sample size was 46. For any loss of follow up, sample size was estimated to be 50.

Data collection, modifiable risk factors assessment, and intervention

Data collection was done with a standard proforma, formulated using relevant literature. Modifiable factors: alcohol, obesity, and psychological stress were assessed through the “Alcohol Use Disorders Identification Test (AUDIT)”,¹² WHO classification of weight status (2014),¹³ and perceived stress scale questionnaire, respectively.¹⁴ Smoking was assessed by, “number of cigarettes smoked/day”. Intervention was in the form of counselling for stressors, and guidance for weight loss, alcohol reduction, and to reduce smoking.

Sample collection and semen analysis

Semen samples were collected in a private room near the laboratory in a sterile plastic container. The

samples were liquefied for 30 min in 37°C before analysis. Macroscopic and microscopic examination of semen was performed according to the WHO laboratory manual.¹⁵

Follow up

Intervention for modifiable risk factors was initiated and follow up was done at 3 and 6 month points, with continuation of intervention in the interim. Risk factors assessment, and semen analysis were carried out at baseline and during follow up visits.

Statistical Analysis

Data was analysed using R software version 3.6.1. Categorical variables were represented using frequency distribution. Mean and standard deviation were used to represent continuous variable. The association among variables was assessed using Chi square test, ($P < 0.05$). Mann Whitney test and Friedman’s ANOVA were used to find difference between the groups and at different time points, ($P < 0.05$), respectively.

Results

Of the total participants (n=50), mean age and body mass index (BMI) were 31.22 years and 23.19 ± 4.14 kg/m², respectively. Most of the patients had normal BMI (n=38), were teetotallers (n=33), non-smokers (n=32), not stressed (n=29), and demonstrated presence of >2 risk factors in (n=40). [Table 1]

Table 1: Distribution of modifiable risk factors

Risk factors	Frequency (%)
Body mass index	
Under weight	2 (4.0)
Normal	38 (76.0)
Overweight	2 (4.0)
Obese	8 (16.0)
Alcohol	
Present	17 (34.0)
Absent	33 (66.0)
Smoking	
Present	18 (36.0)
Absent	32 (64.0)
Stress	
Present	21 (42.0)
Absent	29 (58.0)
>2 risk factors	
Present	40 (80.0)
Absent	10 (20.0)

Among the 17 alcohol consumers, most had 2-3 drinks/day (n=10). In smoker group, most of the patients smoked 1 to 5 cig/day (n=6), followed by 5 to 10 cig/day and 10 to 15 cig/day (n=5). In stress prone patients, cases under severe stress were (n=8), followed by low

stress (n=7). Semen characteristics observed before intervention were: normal semen volume (n=39), normal viscosity (n=50), concentration <15 million/ml (n=41), pH>7.2 (n=38), total motility <40% (n=38), normal forms >4% (n=36), with mean liquefaction time 17.90±5.06. [Table 2]

Table 2: Characteristics of sperm before intervention

Sperm parameter	Frequency (%)	Mean± SD
Semen volume		
<1.5ml (Low)	11 (22.0)	2.11±0.65
>1.5ml (Normal)	39 (78.0)	
Viscosity		
Normal	50 (100.0)	
Concentration (million/ml)		
<15 million/ml	41 (82.0)	9.72±5.07
>15 million/ml	9 (18.0)	
pH		
<7.2	12 (24.0)	7.40±0.17
>7.2	38 (76.0)	
Liquefaction time	-	17.90±5.06
Total motility (%)		
<40	38 (76.0)	27.52±13.23
>40	12 (24.0)	
Normal forms (%)		
<4%	14 (28.0)	18.88±15.73
>4%	36 (72.0)	

There was no association seen between semen parameters and obesity, alcohol and stress, respectively, (P>0.05). Association was observed between semen PH and smoking (P=0.003), and association was also found between semen volume and more than two risk factors (P=0.0374). There was also no association observed between respective risk factors and liquefaction time

among the groups; obese vs nonobese (P=0.422), alcoholics vs non alcoholics (P=0.87), smokers vs non-smokers (P=0.81), and stressed vs non-stressed (P=0.375). Semen parameters had shown difference at different time points with respect to volume (P=0.003), PH (P=0.007), liquefaction time (P<0.001), concentration (P<0.001), total motility (P=0.011) and

normal forms ($P<0.001$), respectively. Table 3

Table 3: Semen parameters at different time intervals

Variable	Time point	Mean	S.D.	P value
Volume	Pre	1.94	0.62	0.003*
	3 months	2.20	0.53	
	6 months	2.14	0.45	
PH	Pre	7.48	0.505	0.007*
	3 months	7.64	0.485	
	6 months	7.34	0.479	
Liquefaction time	Pre	17.9	5.06	<0.001*
	3 months	17	3.78	
	6 months	16.1	3.54	
Concentration	Pre	9.74	5.05	<0.001*
	3 months	9.84	5.44	
	6 months	11.54	5.64	
Total motility	Pre	27.52	13.22	0.011*
	3 months	25.84	13.77	
	6 months	27.16	13.47	
Normal forms	Pre	18.88	15.73	<0.001*
	3 months	12.64	12.80	
	6 months	13.82	13.92	

*Significant, Friedman's ANOVA

Patients who underwent counselling showed improvement in semen volume and change in pH at 3 and 6 months follow up. Cases in whom weight reduction was observed improvement was seen with semen volume ($P=0.05$), PH ($P=0.011$), liquefaction time ($P=0.05$), concentration ($P=0.001$), total motility ($P=0.002$), and normal forms ($P=0.003$).

Participants who reduced alcohol consumption, improvement was seen with concentration of semen volume ($P=0.001$), PH ($P=0.001$), liquefaction time ($P=0.001$), concentration ($P<0.001$) and normal forms ($P<0.001$) at 3 and 6 months follow-up. Patients who reduced smoking, improvement observed in semen

PH ($P=0.002$), concentration ($P=0.001$), total motility ($P=0.001$), and normal forms ($P=0.021$) at 3 and 6 months follow up.

Participants in whom two or more than two risk factors observed, improvement was seen in semen volume ($P=0.001$), PH ($P=0.008$), liquefaction time ($P=0.022$), concentration ($P=0.001$), and normal forms ($P=0.001$) at 3 and 6 months.

Discussion

Evidence of a global reduction in the quality of human sperm over recent decades has been accumulating

and this trend is also seen in the Indian population. Emergent lifestyle associated factors could be a reason for it.^{16,17} India with a growing economy and evolving lifestyle is privy to lifestyle associated health conditions and studies in India pertaining to male infertility present a paucity in research. Thus, the aim of this study was to determine the association between sperm parameters and modifiable risk factors in infertile males.

Most of them were suffering from more than two of the above-mentioned risk factors (80.0%). On stratifying risk factors like alcohol, smoking and stress; it was observed that maximum patients had 2-3 drinks/day, smoking habit varied from 1 to 5 cig/day to 5 to 10 cig/day, males had severe to low stress.

Semen parameters like concentration, motility and liquefaction time were not in accordance to WHO values¹⁵, it could be attributed to modifiable risk factors.

In contrast to other studies, association was not seen between semen parameters and risk factors namely; obesity, alcohol and stress.^{16,18} Smoking and semen PH was observed to be associated as found in previous studies.^{10,11} It has been recognised from previous studies, that more than two risk factors could have additive effect on semen parameters.¹²

Exact liquefaction time is of no diagnostic importance unless >2 h elapse without any change.¹⁹ There was no association found between the groups; obese vs nonobese, alcohol consumers vs non-alcohol consumers, smokers vs non-smokers, and stressed vs non-stressed.

Difference was observed in semen parameters at baseline, 3 and 6 months. It points towards effectiveness of interventions, and also fecundity in male patients might make them self-motivated; hence tends to follow them.

Any form of stress can affect male reproductive potential.²⁰ It results in impairment of testosterone secretion.²¹ Thus, counselling related to stress could be effective in maintaining fertility in males.¹⁷

Obese males have fragmented sperm DNA and low mitochondrial membrane potential (MMP), and in turn leads to fecundity in males.²² Thus, on weight reduction improvement was observed in sperm parameters.

It has been previously established that excessive intake of alcohol is harmful to male reproductive potential as it decreases the testosterone levels.^{23,24,25} Thus, its reduction has led to improvements in semen parameters.

Smoking could lead to production of reactive oxygen species (ROS) which in turn are detrimental to male fertility.²⁶ Thus, significant association was found between smoking and semen PH. Hence, improvement was observed as with reduced smoking semen PH became more alkaline.

Presence of two or more than two risk factors can have additive effects on semen parameters, and in turn can cause infertility in males.¹²

Limitations could be large sample size and shorter follow up duration.

Conclusion

Deleterious habits (alcohol & smoking) as well as lifestyle associated factors (obesity & stress) effects semen parameters. These factors can be effectively modified by proper interventions which includes counselling and patient oriented instruction for each individual patient with proper follow ups.

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Gingival Depigmentation Techniques for Pink Aesthetics: Case Series

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Abstract

Introduction: Aesthetics has become a significant aspect of dentistry. Clinicians are facing challenges in achieving acceptable gingival aesthetics. The colour of the gingiva plays an important role in overall aesthetics. Melanin hyper-pigmented gingiva is a benign condition; however it is an aesthetic concern in individuals with high smile line and excessive gingival display. Gingival depigmentation is a periodontal plastic surgical procedure. The depigmentation procedure aims at removing or reducing this hyperpigmentation by various techniques.

Aim: To discuss the different techniques for gingival depigmentation.

Methodology: Individuals with melanin hyperpigmentation of gingiva were treated by different depigmentation techniques namely Scalpel technique (Conventional technique), Bur Abrasion, Diode Laser, Electrosurgery, Cryosurgery and injection of Vitamin C. All the individuals reported comparable post-operative healing.

Conclusion: Different gingival depigmentation techniques provide comparable postoperative healing resulting in an aesthetic smile.

Keywords: Melanin hyperpigmentation, gingival depigmentation, laser, electrosurgery, cryosurgery, Vitamin C.

Introduction

Aesthetics has become a significant aspect of dentistry. Clinicians are facing challenges in achieving acceptable gingival aesthetics as well as addressing

biologic and functional problems. The colour of the gingiva plays an important role in overall aesthetics. Physiological pigmentation of the oral mucosa is clinically manifested as multifocal or diffuse melanin pigmentation with variable amount in different ethnic groups (Cicek, 2003).¹

Clinical melanin hyperpigmentation does not present a medical problem and is a benign condition. However; it is an aesthetic concern in individuals with high smile line and excessive gingival display. The demand for cosmetic therapy is commonly made by individuals with gingival melanin hyperpigmentation.²

Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival

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hyperpigmentation is removed or reduced by various techniques. The foremost indication for depigmentation therapy is the demand by a person for improved aesthetics.³

Different gingival depigmentation methods: ⁴

I. Methods aimed at removing the pigmented gingiva:

A. Surgical methods:

- a. Scalpel surgical technique
- b. Bur abrasion method
- c. Electrosurgery
- d. Cryosurgery
- e. Lasers
 - i. Neodymium: Yttrium-Aluminium Garnet (Nd:YAG) lasers.
 - ii. Erbium:YAG (Er:YAG) lasers
 - iii. Carbon dioxide (CO₂) lasers
- f. Radiosurgery

B. Chemical methods:

- a. 90% phenol and 95% ethanol
- b. Vitamin C

II. Methods aimed at masking the pigmented gingiva:

- a. Free gingival graft.
- b. Sub-epithelial connective tissue graft.
- c. Acellular dermal matrix allograft.

Case Series

The present case series discusses the various techniques for gingival depigmentation. Individuals with melanin hyperpigmentation of gingiva were

treated by different depigmentation techniques namely Scalpel technique (Conventional technique), Gingival Bur Abrasion technique, Diode Laser, Electrosurgery, Cryosurgery and injection of Vitamin C.

Gingival depigmentation was performed in individuals with chief complaint of black looking gums. Past dental history, medical history and family history were non-significant. There was no reported allergy to any medications. Extra-oral & Intra-oral examination revealed no significant findings. Gingival examination revealed generalised melanin hyperpigmentation. Periodontal examination revealed a healthy periodontium. Complete haemogram values were within normal limits.

Treatment

The entire procedure was explained to the subjects and informed signed consent was obtained. Full mouth scaling and root planing was done. Depigmentation procedure was performed using scalpel or bur abrasion or laser or electrosurgery or cryosurgery. In the non-surgical technique, Vitamin C was injected intraepithelially into the gingiva with the help of insulin syringe. Subjects were advised to use Chlorhexidine Mouthwash 10 ml of 0.2% twice a day for 15 days after the surgery.

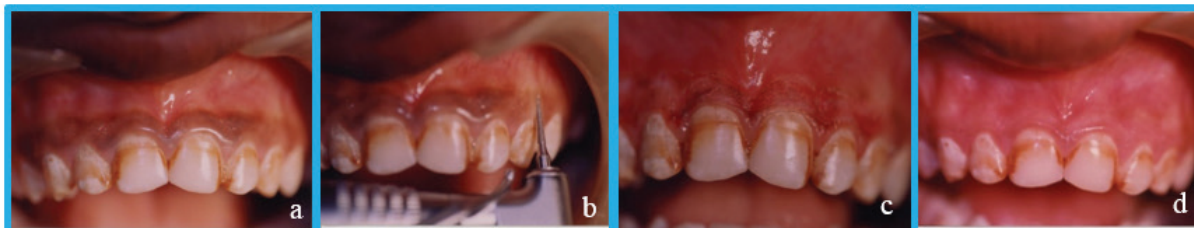
Case 1: Scalpel Technique

25 year old female patient reported with the chief complaint of black gums on smiling. Depigmentation was performed with scalpel blade no: 15 under local anesthesia. Care was taken to remove the remnants of pigmented epithelial layer if any. The surgical site was then covered with a periodontal dressing. Patient was recalled after 1 week for removal of periodontal dressing and post-operative evaluation.



Case 2: Gingival Abrasion Technique

20 year old female patient reported with chief complaint of unpleasant smile. Depigmentation was performed with diamond bur in a contra-angled handpiece at low speed and saline irrigation. The surgical site was then covered with a periodontal dressing. Patient was recalled after 1 week for removal of periodontal dressing and post-operative evaluation.



Case 3: Laser Technique

20 year old female patient reported with chief complaint of unpleasant smile. Depigmentation was performed with Diode laser (810nm) at 1-1.2 Watt power in contact mode with brush like strokes and saline irrigation. Vitamin E was applied topical at the operated area. Also patient was asked to apply Vitamin E at the operated site thrice daily for three days. Patient was recalled after 1 week for post-operative evaluation.



Case 4: Electrosurgery Technique

23 year old female patient reported with chief complaint of unpleasant smile. Depigmentation was performed with single wire and loop electrode in contact mode with brush like strokes and saline irrigation. Care was taken to remove the remnants of pigmented epithelial layer if any. The surgical site was then covered with a periodontal dressing. Patient was recalled after 1 week for removal of periodontal dressing and post-operative evaluation.



Case 5: Cryosurgery Technique

22 year old female patient reported with chief complaint of unpleasant smile. Depigmentation was performed with small cotton pellets were dipped in the liquid nitrogen (-196°C) (Bishop K, 1994), carried in a bowl and applied on the melanin pigmented gingiva on

the anterior sextant on both the maxillary and mandibular jaws. The cotton pellets were held with tweezers and were applied on the sextant with light pressure, for 30 seconds (Darbandi A, Shahbaz NA. 2004), so that the pellet does not stick to the mucosa. The frozen site thawed spontaneously within one minute and mild

erythema developed. Subsequently, the cotton pellet was gently lifted and the procedure was continued on all the pigmented sextant of gingiva. The patient was recalled after 1 week for evaluation.



Case 6: Vitamin C Injection Technique

18yr old female patient reported with chief complaint of black gums. About 0.1 – 0.2ml of Vitamin C was injected in the gingiva in relation to each tooth, using an insulin syringe. Depending on the teeth with gingival pigmentation multiple injections were given. The patient was recalled after 1 week for evaluation.



Discussion

Melanin pigmentation is caused due to melanin deposition by melanocytes which are located at the basal and suprabasal layers of the oral epithelium. Different treatment modalities have been used for removal of pigmentation in the process of depigmentation (Pontes et al, 2006).⁵

In the present case series, all the individuals reported comparable post-operative healing.

The selection of a particular technique depends on various factors; namely: clinical experiences, gingival biotype/ periodontal phenotype, extent of pigmentation, patient acceptability, affordability & preferences.

Advantages & Disadvantages of each technique used in present case series:

1. Scalpel Technique:

Advantages:

- Ø Simple & Effective
- Ø Most economical of all other techniques

Ø Does not require any sophisticated armamentarium

Ø Easy to perform

Ø Less time consuming

Disadvantages:

Ø Bleeding during and after the procedure

Ø It is necessary to cover the exposed lamina propria with periodontal dressing for 7 to 10 days (Almas & Sadiq, 2002)

2. Gingival Abrasion technique:

Advantages:

The first documented case using this technique was reported by Ginwalla et al in 1966.

Ø Relatively simple

Ø versatile technique

Ø Requires minimum time

Ø Doesn't require sophisticated instruments destruction.

Disadvantages:

- Ø Overpitting of the gingival surface
- Ø Removal of excessive tissue due to high speed.
- Ø Thermal damage on uncontrolled application
- Ø Effective in mild to moderate gingival pigmentation

3. Laser Technique:

Advantages:

- Ø Good results
- Ø Minimally invasive
- Ø Minimal pain & discomfort

Disadvantages:

- Ø Requires professional training
- Ø Bone necrosis & pulpal necrosis
- Ø Protective eye wear
- Ø Require sophisticated equipment
- Ø Occupies large space
- Ø Expensive

4. Electrosurgery Technique:

Advantages:

- Ø Minimal pain and discomfort
- Ø Less time consuming
- Ø Minimal bleeding.
- Ø Faster healing

Disadvantages:

- Ø Requires more expertise than scalpel surgery
- Ø Thermal damage on prolonged or repeated application of electric current to tissues
- Ø Improper use can result in undesired tissue

Ø Bone necrosis (Ozbayrak et al, 2000)

Ø Pulpal necrosis

5. Cryosurgery Technique:

Advantages:

- Ø Does not require local anaesthesia
- Ø No bleeding
- Ø Does not require placement of periodontal dressing
- Ø Less time consuming
- Ø Quick healing
- Ø Excellent cosmetic results

Disadvantages:

- Ø Requires use of protective eyewear
- Ø Special storage boxes or cylinders
- Ø Considerable swelling on prolonged freezing
- Ø Prolonged freezing ↑ tissue destruction (Almas & Sadiq, 2002)

The clinical responses of oral soft tissues to cryotherapy usually include courses of tissue edema, subepithelial hemorrhage, blister formation, necrosis, sloughing, and repair.

6. Vitamin C Injection technique:

Advantages:

- Ø Non-surgical technique
- Ø Minimally invasive
- Ø No bleeding
- Ø Placement of periodontal dressing not required
- Ø Doesn't require sophisticated instruments

Disadvantages:

- Ø Not effective in moderate to severe pigmentation

- Ø Slow process of depigmentation
- Ø Multiple patient visit

Conclusion

Different gingival depigmentation techniques provide comparable postoperative healing resulting in an aesthetic smile.

It can be concluded that depigmentation of hyper pigmented gingiva by a particular technique depends on various factors namely: extent of pigmentation, gingival biotype (periodontal phenotype), ease of performance, cost effective, minimal or no discomfort, aesthetically acceptable to the patient, patient preferences.

Ethical Clearance: Taken from Institutional Ethical Committee

Source of Funding: Self

Conflict of Interest: Nil

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- Clinical Photograph Views of the Cases Treated:
- a. Pre-operative view
 - b. Intra-operative view
 - c. Immediate post-operative view
 - d. 2 Weeks post-operative view

An Overview on Learning Difficulty among School Children

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Abstract

Formal schooling in many other nations begins between ages 4 and 5, some research states that it starts earlier than this. The function of elementary schools throughout the world is to provide opportunities for children to acquire at least basic competencies in reading, writing, and computation. During middle childhood years, children are thought to be functioning developmentally at what Piaget termed the concrete and formal operational stages. Basic literacy as well as computational and conceptual skills is acquired at this phase. But some children may not be able to learn one or more of these skills as per their age. Their intellectual capacity and normal visual and physical abilities are unable to acquire one or more age appropriate language and /or arithmetic skills. They find it difficult to acquire the skill even when adequate learning opportunities are provided. These children have learning disabilities/ difficulties.

Studies have revealed that nearly 10% of the childhood population has developmental language disorders of one type or the other and 8-10% of the school population has learning disability of one form or the other. Early intervention presupposes early identification. At present, there is no universally standardized screening procedure to guide referrals from schools. Interventions to rectify the issue should focus on developing and strengthening language and basic skills of reading, writing and arithmetic. In addition we should ensure that children should be allowed to “think” for them, to develop higher cognitive functioning is vital.

Key words: Concrete stage, Formal operational stage, computation, conceptual, intervention

Introduction

The period from infancy through early childhood is a time of remarkable growth and change. Developmental psychologists look at things as all round development such as the physical, cognitive, and emotional growth that takes place during this critical period of development¹. Early childhood is defined as the period from birth to eight years. This is a time of remarkable brain development. During this stage, children are highly influenced by the environment and the people that surround them.

Early childhood care and education (ECCE) is more than preparation for primary school. The main aim is the holistic development of a child’s social, emotional, cognitive and physical needs. This helps in order to build a solid and broad foundation for lifelong learning and wellbeing².

Middle childhood is marked by physical maturation. The social influences become an important part in the life of children which make their way through elementary school. Kids begin to form friendships, gain competency through schoolwork, and continue to build their unique sense of self³.

According to UNESCO’s Education 2030 agenda aims to ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education⁴. The United Nations Children’s Fund (UNICEF) has identified childhood as that stage of life

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experienced by any person between birth and fifteen years. United Nations Convention on the Rights of the Child, in its Article 1 of 1989 states that a child is any person under the age of eighteen⁵.

Formal schooling in many countries begins between ages 4 and 5. In some countries the research and theory reviewed encompasses this earlier period as well. Around the world the most widely recognized function of elementary schools is to provide opportunities for children to acquire at least basic competencies in reading, writing, and computation. The effects of school education on children may not be obvious in societies in which the vast majorities attend school. However, in countries in which smaller proportions of the population attend school, the effects are striking. According to the World Bank (1980) records, 64 percent of the children ages 6-11 in developing countries attended school in 1977, compared with 94 percent of the same-age children in developed countries. A big difference in literacy and other cognitive skills appear when persons who have attended at least elementary school are compared with those who have not been exposed to formal education⁶.

During the important middle childhood years, children are thought to be functioning developmentally. Piaget termed this as concrete and formal operational stages. At this phase, basic literacy as well as computational and conceptual skills is acquired. Subsequently during the school years children learn to read, write and do calculations according to their age and intellectual capacity. Children also start developing relatively permanent attitudes about schools and learning, including study habits.

A child's academic and social self-concepts develop gradually with age and the pressures of peer influence begin to emerge during the early school years⁷. Some children may not be able to learn one or more of these skills as per their and intellectual capacity and normal visual and physical abilities. They are unable to acquire one or more age appropriate language or arithmetic skills and sometimes both even when adequate learning opportunities are provided. These children have learning disabilities/ difficulties⁸.

Definitions of learning disability and learning difficulties

Learning is popularly regarded as the process of acquiring various aspects like new knowledge, behaviors, skills, values, preferences or understanding, and may also involve synthesizing different types of information⁹. If a child is not keeping up with such learning process at school, or is displaying behavioral problems, they may be facing a learning difficulty¹⁰. Learning difficulties (LD) are problems that affect the brain's ability to receive process, analyze, or store information.

Language is changing all the time and the words used to describe a particular impairment or disability change as a result of listening to people with personal experience and sometimes as a result of changing values and attitudes in society. The same words can have different meanings in different countries. Although we share a common language with some countries such words used to describe particular disabilities related to learning are different. People can often find the term 'learning disability' confusing because there are several different explanations about what a learning disability really is. Learning disability and learning difficulties are terms that are commonly used in the UK. These two terms are often interchangeable when used in the context of health and social care for adults. Some people with learning disabilities prefer the term learning difficulties.

History suggests that the term learning disabilities originated with and became popularized by Dr. Samuel Kirk based on his writings in the early 1960s. The comments that were made by him at the April 6, 1963, Conference on Exploration into Problems of the Perceptually Handicapped Child led to the use of this term. The label proposed by him was "enthusiastically received and helped to unite the participants into an organization known as the Association for Children with Learning Disabilities. This is the forerunner of today's Learning Disabilities Association"¹¹.

The term "learning disabilities" is used to describe "a group of children who have disorders in development in language, speech, reading, and associated communication skills needed for social interaction. Children who have sensory handicaps such as blindness or deafness are not included. Also the children excluded from this group are children those who have generalized mental retardation.

As Smith (1979) observes, it is the quantity, intensity, and duration of the behaviors that lead to the problems in school and elsewhere. Learning disabilities may also be mild, moderate, or severe. Students differ in their coping skills too. According to Gargiulo (2004), not all students with learning disabilities will exhibit these characteristics, and many pupils who demonstrate these same behaviors are quite successful in the classroom. According to Bowe (2005), “some learn to adjust to LD so well that they ‘pass’ as not having a disability, while others struggle throughout their lives to even do ‘simple’ things. Despite these differences, LD always begins in childhood and always is a life-long condition”¹².

Over time, parents, educators, and other professionals have singled out a wide variety of characteristics associated with learning disabilities. One of the earliest profiles includes the following ten frequently cited attributes such as:

- Hyperactivity • Impulsivity • Perceptual-motor impairments • Disorders of memory and thinking
- Emotional lability • Academic difficulties • Coordination problems • Language deficits • Disorders of attention • Equivocal neurological signs

After almost 35 years, Lerner identified nine learning and behavioral characteristics of individuals with learning disabilities:

- Disorders of attention • Reading difficulties • Poor motor abilities • Written language difficulties
- Oral language difficulties • Social skills deficits • Psychological process deficits • Quantitative disorders • Information processing problems

Academic Achievement Deficits

Children with learning disabilities often struggle in various areas of academic performance. During the elementary school years, a discrepancy between ability and achievement begins to emerge in students with learning disabilities. This situation perplexes many teachers. These students seem to have strengths similar to their peers in several areas, but their rate of learning is unexpectedly slower. These problems usually persist from the primary grades through the end of formal schooling, including college¹³.

Inadequacy in academics for children with learning disabilities normally falls into the following areas like reading, mathematics, and written expression. Some children have problems in only one selected academic area, while some children may experience difficulties in all the three areas.

Learning difficulty which is a developmental disorder, displays difficulty in reading, writing, comprehending or using language, calculations. The child is exposed to conventional schooling, adequate motivation and opportunity, and intact hearing and visual capacity. Some children may also have ineffective information processing, thereby affecting his prioritizing and organizing abilities¹⁴.

About 5-15% of school-going children have this disability. Dyslexia is the most common and most studied one, affecting 80% of all those identified as learning-disabled. There are significant gender differences: boys are more often affected in developmental dyslexia than girls (4:1). However, in developmental dyscalculia and language difficulties, there are no noticeable differences. Considering Indian scenario, information about LD is sparse. The incidence of dyslexia in Indian primary school children has been reported to be 2-18%, dysgraphia 14%, and dyscalculia 5.5%. However, its awareness as a significant cause of academic underachievement has recently increased.

The Situation of learning Difficulty in India

We need to learn from these experiences. At present, in India, LD is considered the prerogative of a few in the big cities. Even Directors of State Education are known to express doubts at the existence of any such disability. Unfortunately, the initiating factor of LD is that, English being a foreign language, a proper education and exposure not being given to most of the children aggravates academic difficulties for the them. This situation also play a major part in masking the processing problems and hence make LD an elusive entity. Teachers attribute the learning difficulties to a “language problem”, not realizing that LD too is a language based disorder¹⁵.

Most of the research and intervention work in the area of LD is being done by private organizations and the NGOs. There is little communication between these

organizations and the state educational authorities. Adding further to the problems, there is a divide between the personnel in the health and the educational fields, be they private or government. The challenges faced with respect to remediation and management is no less daunting. Our educational system lays an overwhelming emphasis on knowing rather than learning and gives importance to theory rather than application. This type of education system is not suited for the child with LD.

Studies revealed that nearly 10% of the childhood population has developmental language disorders of one type or the other and 8-10% of the school population has learning disability of one form or the other. Other studies have been done at child guidance clinics in India where 20% children attending the clinic were diagnosed to be scholastically backward¹⁶. However, variables such as the socio-economic class, exposure to language act as confounding variables in such clinic-based studies. More significant is the successful outcome of early intervention than the one that is initiated later¹⁷.

Conclusion

This implies that though LD is not curable, there is much scope for using compensatory mechanisms to alter functional gaps which are to be initiated early to ensure that the disability is not aggravated further. The child must be able to develop and learn to the best of his/her potential. Early intervention presupposes early identification. At present, there is no universally standardized screening procedure to guide referrals from schools. Interventions should focus on developing and strengthening language and basic skills of reading, writing and arithmetic. In addition ensuring that children are allowed to “think” for them, to develop higher cognitive functioning is vital. Schools should play an important role in identifying such children and expose them to early intervention. This would happen only if the schools equip their teachers to understand what LD is. Thus they would be able to identify them.

Ethical Clearance: Taken from Institutional Review Board committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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Early Intervention for Children with Learning Difficulties: An Update

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Abstract

Identification is an important process that enables detection of children with learning difficulties. The ultimate goal of early identification is to provide appropriate treatment and support needed for successful functioning of the students in and out of school. But identification is rarely performed before the end of kindergarten, or before the first grade. The signs of learning difficulties are generally confirmed during the course of elementary school. Many times pupils are not properly identified as pupils with learning difficulties over an extended period of time which is common for children with high intelligence. Late identification among students may create significant learning difficulties. This may cause a fall in motivation and self-esteem development, and difficulties in learning can continue in adulthood. Because of this, early identification which aims to detect children with developmental problems at an early age is of essential importance. Thus the need for referral of the child for targeted testing and / or detailed assessment becomes an important factor. Researchers are working on different methods to find out the best method for early detection and intervention. Despite the differences that exist, researchers still do not agree which is better and more efficient intervention method. Because of this situation, there is need for additional scientific-professional research in this area, which would have significant educational and practical implications and would contribute to a more successful identification of students with specific learning difficulties and opportunities for more effective identification, prevention and treatment of these students.

Keywords: *identification, intervention, self-esteem, assessment*

Introduction

Learning Difficulty is a developmental disorder that begins by school age, although it may not be recognized until later¹. It involves problems in academic skills, including reading, writing, and math. LDs may also affect the way an individual is able to write, spell words, reason, recall, or organize information. LDs are becomes a lifelong condition that comes with varying levels of challenges unique to each individual. Based upon the

early detection and treatment of the condition the impact that a LD has on an individual can be minimized. The treatments provided should be evidence based and selected as a result of the individual's learning needs, preferences, and background².

A number of definitions have been formulated in the attempt to define learning difficulties. Unfortunately there is still no comprehensive, universally accepted definition. The most commonly used definition, which first was written in 1968 by IDEA (the Individuals with Disabilities Education Act), says: learning disability (LD) is "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read,

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write, spell, or do mathematical calculations. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage”³.

The characteristic indication of students with learning difficulties include: less attention paid to the instructions provided by the teacher and the task which leads to reduced learning engagement; low self-esteem; dysfunctional attitude; negative behavior; lack of cognitive and metacognitive strategies; lack of organization and low efficiency; passivity; not taking risks; frustration; lack of motivation and depressive tendencies⁴. Learning difficulties in some pupils are also diagnosed in nursery school when a parent or a teacher notices that the children cannot follow directions for a game or is struggling to do work that he or she should be able to do easily. But some students develop sophisticated ways of covering up their learning issues, so the learning difficulties may show up until the teen years when schoolwork - and life - gets more complicated and it becomes difficult to correct⁵.

India is a highly populated and a developing country and is “home to one third of the world’s poor”, but since the instigation of “the world’s largest elementary education program” in 2001, remarkable strides have been made in the quality and accessibility of schooling⁶. India has a multi-tiered system of education. Education research, curriculum planning and education policies are enabled by the National Council of Educational Research and Training (NCERT). The schooling include both government and independent institutions. The medium of instruction in most government schools is the state vernacular, which is most commonly accompanied by the national language (Hindi) and English. Because English is prominent in the global market, parents who can afford it will send their children to an English-medium school^{7, 8}. Non-government schools are associated with higher standards and often unregulated and may be highly selective of students⁹. In order to comply with the requirements of the school and curriculum, many Indian families often employ additional after-school tutors. Parents assume that if their ward has difficulty in a

particular subject it is because they have not understood the subject. They either fail to understand that the child has a difficulty in understanding or they do not have knowledge about learning difficulties the student can come across. Parents and teachers should be aware of the learning difficulties a child can develop either in birth or later. Lack of knowledge about LD by the parents, care givers and facilitators will delay the identification and early intervention¹⁰.

Identification of students with learning difficulties:

Identification is an important process that enables detection of children with learning difficulties. The ultimate goal of early identification is to provide appropriate treatment and support needed for successful functioning in and out of school. Usually, the first signs of specific learning difficulties appear as early as in kindergarten. But identification is rarely performed before the end of kindergarten, or before the first grade. The signs of learning difficulties are generally confirmed in the course of elementary school. Many times pupils are not properly identified as pupils with learning difficulties over an extended period of time which is common for children with high intelligence.

Late identification among students may create significant learning difficulties. This may cause a fall in motivation and self-esteem development, and difficulties in learning can continue in adulthood. Because of this, early identification which aims to detect children with developmental problems at an early age is of essential importance. Among some children, slower growth is temporary and resolves itself with time, while in others it is retained within the various areas of functioning. Thus the need for referral of the child for targeted testing and / or detailed assessment becomes an important factor¹¹.

Early intervention and prevention of learning difficulties

Early intervention suggests that schools should not wait to identify difficulties in students to reinforce, but they should try to find students “at risk” as early as possible. Special education enables students with learning disabilities to be educated and to have benefit from it. This means that these students will be provided

with free and appropriate regular education, just as it is given to their peers (according to Vaughn & Linan-Thompson, 2003). Teaching approaches that have a significant impact on the achievement of students with learning difficulties should be defined, clear, and carefully designed in relation to the area in which instruction is required. Torgesen (1996, according to Vaughn & Linan-Thompson, 2003) stated that special education differs from regular education in being clearer, more intense, and more supportive. Effective educational approaches for students with learning difficulties and their effects can be summarized as follows.

Controlling the difficulty of the tasks is associated with improved academic outcomes. Teaching students in small, interactive groups is associated with increased achievement. Direct and clear instruction is associated with improved academic outcomes. Higher order processing skills may facilitate the integration of knowledge and skills in solving complex mathematical problems. Building blocks for reading and writing is essential to improve the reading and writing outcomes. The process of writing and its organizational aspects are associated with improved outcomes in writing. Teachers who provide systematic feedback on the outcomes assist students with learning disabilities ¹².

Prevention and early intervention in education can be done in levels whereupon it starts with effective exercises designed for the whole class. Then support is offered to students who need it by including monitoring of outcomes and monitoring of progress as part of teaching within the whole class. O'Connor (2000) tried to reduce reading errors made by preschool children through teaching which consisted of four levels that varied in terms of length, intensity and duration. This instruction lasted 2 years. At the end of the first grade, the mistakes made by the children with specific learning difficulties were reduced. However, the number of children who were directed to the centers for special education was not reduced. O'Connor concluded that this is related to the limited resources available to them in schools ¹³. Thus it prevented the effects of instruction that was designed for student's progress. Dickson & Brusuck (1999) also applied the same method with little difference. They found a lot of progress in reading among students who were taught in small groups. Dickson & Brusuck highlighted that deficit of time and

resources needed to provide intensive instruction are necessary to the students with learning disabilities ¹⁴.

Teaching in small groups is one of the key variables in the models of early prevention / intervention in students with learning disabilities. Intervention in smaller groups enhances greater interaction between teachers and students, individualization of teaching, focus on task, monitoring by the teacher and feedback. If reading has to be successful the size of the group is important for several reasons. Smaller groups enable students to achieve better results. The size of the group also affects the quantity and quality of verbal speech among students. Teaching reading can be customized to the individual needs of students. Elbaum & co. (1999) also examined the outcomes of teaching groups of children who have difficulties in reading. His study revealed that the effects among students who were taught in small groups and in pairs were significantly greater than the students who were taught within a larger group. Similarly, other studies showed that teaching in small groups has major effects versus learning within the whole class ¹⁵.

Individual instruction and care is required for some students because teaching in small groups may not be sufficient to provide the required level of focus and intensity. Several studies support the effectiveness of such instruction for students identified with learning difficulties. More recent research shows that additional individual instruction to students allowed them to achieve better results. Two new studies of intensive, individual instruction for at risk students gave impressive results. Vellutino & co. (1996, according to Vaughn & Linan-Thompson, 2003) conducted a study on mentoring the students for two semesters in the identification of letters, phonemic analysis and reading skills. This mentoring was conducted in the duration of 20 minutes each day for first graders who have reading difficulties. The results of this research showed that individual mentoring helped most students to have a higher GPA in reading ¹².

Another most important variable that can influence the effectiveness of teaching is its duration of the session or intensity. The way to increase the intensity of teaching is to add one more session each day. Torgesen & co. (2001) conducted intensive, individual instruction of students with learning disabilities which

consisted of two sessions a day (50 minutes for each session). Students had significant improvements and most of these improvements were kept in the next two years. In addition, few students were able to return to regular classes and no need was identified for additional instruction¹⁶. To determine the length of teaching that is appropriate for students with reading difficulties of second grade, Vaughn and Linan-Thompson & Nickman (2003) performed teaching in small groups of 54 students from the second grade through 10, 20 and 30 weeks. Students with learning disabilities continued to receive additional instruction until they reached a predetermined criterion at each level. Of the 45 students who were present in all assessments, 11 students failed to reach the criterion after 30 weeks, 10 students reached the criterion after 10 weeks, 15 after 20 weeks, and 9 after 30 weeks. The results support the importance of varying the size of the groups and the intensity of intervention¹².

Conclusion

An effective approach to early prevention and intervention is to allocate teaching into arrays or levels, whereupon it begins with effective exercises designed for the whole class, and then provides support to the students that need it by monitoring the outcomes and the progress as part of teaching within the class. Students who are diagnosed with specific learning disabilities are exposed to specific treatments. Despite the differences that exist, researchers still do not agree which is better and more efficient intervention method. Because of this situation, there is need for additional scientific-professional research in this area, which would have significant educational and practical implications and would contribute to a more successful identification of students with specific learning difficulties and opportunities for more effective identification, prevention and treatment of these students.

Ethical Clearance: Taken from Institutional Review Board committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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Comparison of Effect of Aerobic Training Versus Resistance Training on Cancer-Related Fatigue and Quality of Life in Breast Cancer Survivors

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Abstract

Background: Cancer-related fatigue is the most common side effect of cancer treatment which negatively impacts the Quality Of Life in breast cancer survivors. Hence the main purpose of this study was to compare the effects of aerobic versus resistance training on fatigue level and QOL in breast cancer survivors.

Methods: sixty patients were assigned in two groups. They were screened for cancer-related fatigue and quality of life. The aerobic exercise program included supervised walking with low to moderate intensity. Resistance training group received body weight exercises. Outcome measures such as FACT-B, FACIT-Fatigue, RPE, and VO₂max (using Queen's college step test) were taken at baseline and after 6-weeks of the treatment protocol. Student t-tests (two-tailed, paired & unpaired) were used to find the significance of study parameters on the continuous scale within and between two groups.

Results: The result of this study showed that there was a significant reduction in cancer-related fatigue FACIT-Fatigue score ($p < 0.001$), RPE ($p < 0.001$), VO₂max ($p < 0.001$) and improvement in the quality of life FACT-B score ($p < 0.001$) in both the training groups. However resistance training group has a better improvement in the score.

Conclusion: Resistance training showed more significant improvement in cancer-related fatigue and quality of life as compared to aerobic training.

Keywords: Breast cancer survivors, cancer-related fatigue, Quality of life.

Introduction

Breast cancer is one of the most common cancers worldwide representing nearly a quarter (25%) of all cancers¹. Breast cancer has ranked the number one cancer among Indian females with the rate as high as 25.8 per 100,000 women¹. Although advancement in breast cancer treatment and early detection have contributed to an increase in breast cancer survival rate.

Fatigue related to cancer is considered to be the most prevalent and distressing and has been defined as "an overwhelming sense of exhaustion and decreased capacity for physical and mental work at usual level" Study report that fatigue shows a high prevalence during adjuvant chemotherapy and can be present for up to 5 years after the treatment is over with no improvement during the first two years² and approximately 33% of individuals with breast cancer report persistent fatigue up to ten years³.

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The Potential mechanism in the development of Cancer-related fatigue can be related to altered metabolism due to decreased peripheral circulation, altered substrate utilization and increase in pro-inflammatory cytokines⁴. Normal protein and hormonal levels related to the inflammatory process can get altered

due to cancer and its treatment which can cause or worsen the fatigue. Treatment kills normal cells and cancer cells which lead to a build-up of cell waste and extra energy is required to clean and repair the damaged tissues leading to fatigue. Other causes of fatigue are Cancer pain, emotional distress, sleep problems, poor nutrition and lack of exercise⁵. Breast cancer and its treatment pose many challenges to the patient's physical, emotional, mental and social well-being which negatively impact the patient's quality of life. Cancer-related fatigue has a detrimental effect on one's well-being, body image, and self-perception.

Exercise had the strongest empirical evidence, with physical activity providing moderate benefit in Cancer-related fatigue. Physical therapy interventions like aerobic exercises, resistive exercises, aquatic exercise, relaxation exercises, yoga and flexibility exercises etc. are effective in improving quality of life and help to alleviate fatigue⁶⁻⁹.

An aerobic exercise improves cardiopulmonary fitness¹⁰, hence reduces fatigue level and improves quality of life. Whereas, resistance training improves muscle strength, and thus reduces fatigue¹¹.

Many of the researchers have assessed the effect of aerobic training engaging large muscle group like Supervised-treadmill⁶, leg pedaling exercise¹²; Unsupervised-home based walking¹³ etc. in breast cancer survivors on fatigue level and quality of life and also many studies have been done on effect of resistance training on large group of muscles using free weights, machine-based resistance⁷ and Therabands¹⁴ on fatigue level and quality of life. As both, Aerobic and Resistance training was found to be effective in reducing cancer-related fatigue.

Hence, the objective of this study is to study the effects of Aerobic & Body Weight Resistance Training on FACIT – Fatigue Scale, RPE, VO₂ max and Quality Of Life Scale, FACT – B in Breast Cancer Survivors.

Method

60 Breast Cancer survivors were selected for the study after obtaining approval from the Institutional Ethical Committee, the present comparative study was started with purposive randomized sampling technique

in various oncology OPDs, multispecialty hospitals and cancer foundations. sixty Breast cancer female survivors aged 35-55 complaining of cancer-related fatigue after completing six months of adjuvant therapy (chemotherapy, radiotherapy) or underwent surgery (lumpectomy or mastectomy), willing to participate were included in the study. Survivors with other concurrent metastasis anywhere else in the body, diagnosed case of any cardiac or respiratory condition, contra-indicated for exercise training (severe dyspnea, chest pain, severe nausea, ataxia, dizziness etc.) and any other neurological or recent musculoskeletal problems were excluded from the study.

All subjects signed the consent form and they were given an explanation and demonstration

about the testing method, protocol, and duration of the intervention.

All the 60 subjects completed their 6 weeks of training session and there were no dropouts during the treatment session. They were further randomly allocated into two groups by Chit method, 30 subjects in Aerobic walking group, and 30 subjects in Resistance exercise group. Measurements were taken for fatigue level using Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACIT-F Scale). The ICC value of its validity is 0.93 and has the reliability of 0.89.¹⁵

The health-related Quality Of Life (HRQL) was measured using the FACT-B Questionnaire that assesses both generic and breast cancer-specific quality of life. The ICC values of its validity and reliability is 0.937 and 0.7 respectively¹⁶. RPE¹⁷ and VO₂max were measured by performing Queen's College Step test. The ICC value of the reliability of RPE was 0.75 and VO₂max was 0.83.

Queen's College Step test:

VO₂max was calculated by the following formula¹⁸.

• $VO_2\max = 65.81 - (0.1847 \times \text{heart rate per minute}) \text{ (mL/kg/min)}$

VO₂max was used to measure the aerobic capacity²⁰; Queens's college step test was taken for RPE, on the modified Borg's scale, as an indication of impending fatigue¹⁷.

Outcome Measures were taken pre-treatment and post-treatment after 6 weeks.

Both the groups received the same warm up and cool down exercises before and after the exercise session, respectively. Treatment duration and frequency was kept same for both the groups.

PROCEDURE FOR AEROBIC GROUP: Group A received supervised aerobic exercise program which comprised of walking on a level surface thrice a week for 6 weeks. Progression of the exercise was after every two weeks in the intensity of exercise or duration. Rate of perceived exertion (RPE) on Modified Borg's scale was used to check the intensity of aerobic exercise¹⁷.

WEEK (PROGRESSION)	INTENSITY (PROGRESSION)	TIME (PROGRESSION)
0-2 weeks	Mild intensity, RPE1-3	20minutes
2-4 weeks	Mild intensity, RPE 1-3	30 minutes
4-6 weeks	Moderate intensity, RPE 4-6	30 minutes

PROCEDURE FOR RESISTANCE GROUP: Group B received supervised body weight resistance exercises thrice a week. The exercise protocol includes six exercises which consisted of wall pushups, wall supported squats, forward lunges, abdominal crunches, bridging and spot marching.

WEEK (PROGRESSION)	REPETITIONS (PROGRESSION)	SETS (PROGRESSION)
0-2 weeks	8 repetitions	2 sets of each exercise
2-4 weeks	10 repetitions	2 sets of each exercise
4-6 weeks	10 repetitions	3 sets of each exercise

1-2 minutes of rest period was given after each set. The time required to perform resisted exercise was around 20 minutes in the first two weeks and 30 minutes

from 2-6 weeks. The time required for completing the exercises in both the groups was the same.

Results

Intragroup: Group A (Aerobic training)

Table 1: Comparison of the FACIT-Fatigue score, FACT-B score, RPE & VO₂ max values before and after intervention in Aerobic training group.**N=30**

		Mean	Std. Deviation	P value
FACIT-Fatigue score	Pre	27.23	4.732	<0.05
	Post	33.00	3.353	
FACT-B score	Pre	85.686	12.752	<0.05
	Post	98.033	11.232	
RPE	Pre	2.566	0.678	<0.05
	Post	1.483	0.579	
VO ₂ max	Pre	44.248	2.348	<0.05
	Post	46.254	2.090	

Intragroup: Group B (Resistance training)**Table 2: Comparison of the FACIT-Fatigue score, FACT-B score, RPE & VO₂ max values before and after intervention in Resistance training group.****N=30**

		Mean	Std. Deviation	P value
FACIT-Fatigue score	Pre	30.23	4.321	<0.05
	Post	44.70	4.095	
FACT-B score	Pre	97.888	10.037	<0.05
	Post	120.854	9.718	
RPE	Pre	4.833	1.620	<0.05
	Post	1.250	0.916	
VO ₂ max	Pre	45.543	2.532	<0.05
	Post	48.311	1.183	

Intergroup:

Table 3: Comparison of the mean difference (pre-post) of FACIT-Fatigue score, FACT-B score, RPE & VO₂ max values among both the groups by unpaired t-test.

N=30

Variables	Group	Mean Difference	Std. Deviation	P value
FACIT-Fatigue score	Aerobic training	5.766	3.202	<0.05
	Resistance training	14.466	4.710	
FACT-B score	Aerobic training	12.346	6.644	<0.05
	Resistance training	22.965	10.176	
RPE	Aerobic training	1.083	0.395	<0.05
	Resistance training	3.583	1.189	
VO ₂ max	Aerobic training	2.006	1.520	>0.05
	Resistance training	2.768	2.330	

The results of the present study show the better improvement in FACIT-Fatigue score, FACT-B score and RPE parameters in resistance training group. While VO₂ max values showed equal improvement among both the groups.

Discussion

The present study was designed to compare the effects of Aerobic training versus Resistance training on Cancer-related fatigue and Quality of life in Breast cancer survivors. The outcome measures analyzed were fatigue (FACIT-Fatigue scale, RPE, VO₂max) and quality of life (FACT-B scale).

The results of the present study showed that there was a significant improvement in mean values of FACIT-Fatigue score, FACT-B score, RPE parameter, and VO₂max post 6 weeks of aerobic training with a p-value <0.05 (Table 1). Patients with cancer undergoing chemotherapy or radiation therapy, all have a deficit that compromise oxygen transport system. Aerobic exercises have a peripheral benefit which includes a net reduction in total peripheral resistance, increase cardiac output, increase gaseous exchange and increase oxygen extraction, thus improves cancer-related fatigue¹⁰.

Meghan Baruth concluded that Home-based physical activity (walking) programs may be an appropriate avenue for alleviating the adverse emotional

and physical side effects, and improves quality of life of women who has recently completed breast cancer treatment¹³.

Table 2 showed that there was a significant improvement in mean values of FACIT-Fatigue score, FACT-B score, RPE parameter and VO₂max post 6 weeks of resistance training with a p-value <0.05. Breast cancer survivors have significantly lower muscle strength than age-matched healthy individuals. Resistance training causes muscle fiber hypertrophy, remodeling of type IIA & type IIB fibers, increase synchronization & motor unit firing, increase tensile strength and increases lean body mass. All these have shown to be effective in reducing cancer-related fatigue¹¹.

Anne Marie Lunde investigated effects of a scheduled home-based exercise intervention in breast cancer patients during adjuvant chemotherapy, on cancer-related fatigue, physical fitness, and activity level. The exercise group had significantly improved peak aerobic capacity, muscle strength, and lean body mass. The findings suggest that generally recommended physical activity levels are enough to relieve cancer-

related fatigue and restore physical capacity in breast cancer patients during adjuvant chemotherapy ².

The result of the present study showed that survivors reported a significant reduction in cancer-related fatigue after completing both the interventions. But there is a more significant improvement in the objectives with resistance training (Table 3). Unpaired t-test was done to see the difference between the two variables suggesting that resistance exercise is more significant in reducing Cancer-related fatigue than aerobic training. Resistance training is an effective type of exercise, affecting fatigue via pathways independent from the cardiovascular system, possibly via muscle mass or function (reduced oxidative stress and acidosis),²⁾ inflammatory process i.e. it increases release of anti-inflammatory cytokines such as IL-10 and IL-1ra and inhibits pro-inflammatory cytokines IL-1 beta and TNF-alpha ²⁰ or metabolic factors i.e. promotes substrate utilization (a shift from anaerobic glycolysis to aerobic respiration), reduces secretion of lactate and proper energy production ⁴.

Kerry S. Courneya and Roane J. Segal conducted a study in breast cancer patients receiving chemotherapy which suggest that aerobic exercise training significantly improved self-esteem, preserved aerobic fitness and maintained body fat levels whereas resistance exercise training significantly improved self-esteem, muscular strength, and lean body mass without causing lymphedema or significant adverse events ¹².

Cancer-related fatigue is a major contributor to the perceived overall quality of life in cancer survivors. The finding of the study was that both the interventions significantly improved the quality of life as in FACT-B scores. Decreases in fatigue were found to be predominantly associated with beneficial changes in physical parameters such as a decrease in physical symptoms and an improvement in perceived physical (role) functioning ²¹. Minimizing loss of physical function during treatment and regaining it afterward, are important for survivors in terms of facilitating activities of daily living. Prolonged inactivity following surgery and adjuvant therapy exacerbates physical debilitation leading to increased fatigue with even minor exertion. Graded exercise interventions for cancer patients have therefore been recommended for breaking the vicious cycle that can develop between inactivity, physical

deconditioning and fatigue ²².

Schwartz et.al suggest that the positive effect of aerobic training on quality of life may be mediated by the positive effect of aerobic training on cancer-related fatigue by improving energy levels and participation in physical activities indicating that cancer-related fatigue may be inversely correlated with quality of life ²³.

This study suggests that the beneficial effects on fatigue could be attributed to both the interventions. Biological mechanisms suggest that exercise may serve as a protective mechanism against the detrimental effects of pro-inflammatory cytokines by balancing the ratio of pro-inflammatory and anti-inflammatory cytokines. Cancer-related fatigue causes psychological distress and sleep disturbances. Functional mechanisms suggest that exercise improves physical functioning and functional capacity in cancer patients ²⁴.

Therefore this study concludes that resistance training for a period of six weeks showed more improvement in cancer-related fatigue and quality of life compared to aerobic exercises.

Conflict of Interest: NIL

Source of Funding: NIL

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Cosmetovigilance in Public Health: A Review

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Abstract

Globally, the number of adverse events reported with cosmetics are very low because of the absence of formal reliable monitoring systems such as cosmetovigilance being in place. Main attributes to this underestimation is due to self-diagnosis, self-use and absence of medical consultation as they may not recognize or give attention to these mild and moderate harmful events. National cosmetovigilance programs may be created to address the issues related to cosmetic as it is ideal to be an ongoing programs as there are many misbranded and spurious products are available in the market with greater potential to cause both serious and non-serious adverse events.

Keywords: Adverse cosmetic events, Cosmetovigilance, Cosmetics safety surveillance.

Cosmetics

Cosmetic are products used to enhance the appearance, fragrance and the texture of a human. The consumption of cosmetics such as products for skin brightening, anti-acne creams, sun protection, body moisturizers and lotion, etc are increasing in accordance with the increase in the standard of living. This increased demand providing a momentum in cosmetic market in India. As per the 'India cosmetic market overview', India's cosmetic market is growing with compound annual growth rate of 17.06% during last five years. Products for hair care, skin care, colour cosmetic, fragrance and oral care are the five different segments of cosmetic market.¹

In India, Drugs and Cosmetics Act 1940 and Rules 1945 regulate Cosmetics Drugs and Cosmetics Act, Section 3(aaa) defines "cosmetics" as "any article intended to be rubbed, poured, sprinkled or sprayed on,

or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and includes any article intended for use as a component of cosmetic."^{2,3} Gazette notification G.S.R 426(E) divides cosmetics into 4 gross categories: Skin products (products for skin care, cleansing, removal of body hair, body hair bleach, body odour corrective products, products for shaving (pre or after shave), products for makeup, perfume, products for sun, and self-tanning and others); Hair and scalp products (cleansing and care products, products for hair colouring, hair styling products and other products for hair and scalp care); Nail and cuticle products (nail varnish and remover, products for nail care and nail hardening, product for nail glue removing, other products for nail and cuticle care); Oral hygiene (tooth care, tooth whiteners, mouth wash, breath spray and other products for oral hygiene).

The ingredients present in majority of the cosmetic are water, preservatives, thickeners, emulsifiers, moisturizers, fragrances and colours. These ingredients may be occurring naturally or artificially, which may have potential impact on the health due to the chemical compound they are made of. Ideally, the quantities of these chemicals are too small to any risk on human health. Water play as the basis for most of the cosmetics such as creams, lotions, deodorants, shampoos,

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conditioners etc., and act as a solvent to ingredients and forms emulsions for consistency. Emulsifiers are any ingredients which help to keep the unlike substance (such as oil and water) from separating and produce a homogenous and well mixed product with expected texture. Some examples of the emulsifiers are potassium cetyl sulphate, polysorbates etc. Preservatives are added to extend the shelf life of the product and prevent the growth of microorganisms such as bacteria and fungi, which may damage the product and cause harm to the consumer. Salicylic acid, formaldehyde, parabens, benzyl alcohol are some of the examples of commonly used preservatives. Thickening agents such as liquid thickeners (eg: cetyl alcohol, stearic acid), naturally derived thickeners (eg: hydroxyethyl cellulose, guar gum), mineral thickeners (eg: magnesium aluminium silicate, silica) and synthetic thickeners (eg: cetyl palmitate, and ammonium acryloyldimethyltaurate) are added to cosmetics to give an appealing consistency. Emollients are added to prevent the water loss from the skin and make it soft (Eg: natural – bees wax, coconut oil, synthetic- butyl stearate and diglycol laurate) and majorly used in lipsticks and lotions. There are various types of colouring agents/ pigments are used in cosmetics. Natural colours are from plant (Eg: beet powder) or animals (cochineal insect). The most common organic pigments are toners and lakes. ⁴

However, products intended for the treatment, prophylaxis and prevention of disease, or affect the function or structure of the body, are considered as drugs. Some products such as anti-dandruff shampoos, makeup with sun protection factor and anti-perspirant deodorants fulfil the definitions of both cosmetics and drugs since these product can have two intended uses. Such products are regulated either as a cosmetic or as a drug depending on the composition of the product.⁵ Misbranded and spurious cosmetic products are also commonly available in the market similar to drugs. Misbranded and spurious cosmetics are defined as per provision of Drugs and Cosmetics Act 1940 and Drug and Cosmetics rule 1945. Cosmetics are called misbranded if it contains an unprescribed color, inappropriate labeling, or contains false/misleading product information. Cosmetics are labeled as spurious when its name resembles another cosmetic; the product resembles another cosmetic or if manufacturer information is misleading/fictitious or does not exist, which can deceive customers.⁶

Safety concerns of cosmetic products

Cosmetic consumers are generally concerned only about the short term result of the product rather than the long term and safety effects of the products being used. Consumers expect that the cosmetics doesn't pose any harmful effects in the body and is safe.⁷ And many of them doesn't even read the labels to identify the ingredients of the product used.⁸

Cosmetics can cause several adverse events along with it helps the consumer feels beautiful. Some of the various reasons for the untoward reactions associated with the cosmetics are sensitivity or allergy for the ingredients used in the product, violations in the colour additives used in the product, microbial contamination of the product, misuse due to improper labeling of the product, violation in the use of ingredients such as preservatives or fragrances that have hazardous substance for the body. It is also proposed that the use of many ingredients and their cumulative effects in the product is one of the major cause of unwanted cosmetic events.⁹

Regulatory authorities of food, drug and cosmetics authorities are frequently advising the manufactures to use the ingredients after necessary testing to avoid the unwanted effects of the cosmetics. Importers and the manufactures are having legal responsibility to ensure the safety of their products. Also, the regulators are recommending the consumers to check the ingredients on the label and the expiration dates, never share the cosmetic products with others, maintain hygiene while using, use minimum required cosmetics with few ingredients, shop from authorised sources etc. ¹⁰⁻¹²

Adverse events to cosmetics can occur immediately after application or after longterm use depending on the ingredient causing the same. Most common adverse events following cosmetics are hyper / hypo pigmentation, acne, scalp injury, itching, photo toxic or photo allergic contact dermatitis, acute hair loss, conjunctivitis, nail loosening from nail bed, irritation of the mucous membrane of the oral cavity etc.^{13,14} Many studies have done to identify the adverse cosmetic events in the past. In a study conducted among the community pharmacists of Naples's found the cosmetic use among 98.5% of their participants and 26.5% of them experienced adverse events. Of which 4.1%

were systemic events such as headache, nausea and the remaining were cutaneous events.¹⁵ Similarly a study done among the female students of Wollo University, reported that 97.3% of them were using cosmetics and the most commonly used products were body cream products (88.8%) and body lotions (89.7%). Also, study found that 31.8% of the participants developed adverse events. The risk factors such as use of more than five products, sharing of cosmetics, adding saliva or water to the product and buying cosmetics from local shops or super markets were associated with the adverse cosmetic events were also identified in this study.¹⁶ Further more, a study from an Ethiopian university, found 97.8% of their participants having the habit of using cosmetics and among them, 18.4% developed cosmetic related adverse events majorly to body lotions and deodorants.¹⁷

Spurious cosmetics in branded bottles are available in the markets. In one of the raids performed in beauty parlours of Pune by Food and Drug Administration officials found the use of products with no license number displayed on the label. Impurities such as presence of heavy metal are reported in lipsticks, lipglosses, eyeshadows hair dye and henna. The commonly found heavy metals are lead, zinc, and cadmium. Due to the use of substandard products in the beauty parlours, technicians at high risk of adverse events such as hand dermatitis, fertility disorders and adverse pregnancy outcomes. Also, due to the exposure of ammonium persulfate, they are at high risk of development of respiratory related events such as asthma.⁶

In a study conducted to assess the extent of lead present in Sindoor, 83.2% of the samples purchased from United States and 78.3% from India contained more than or equal to one micrograms of lead per gram of powder. And the study concluded by describing the need of lead content monitoring in Sindoor. Similarly, commonly used 'kajal' is found to have high level of lead. High level of these compounds can harm and caused adverse events to the humans.⁶

Cosmetovigilance

Similar to Pharmacovigilance, which defines the activities related to the collection, detection, assessment, monitoring, and prevention of adverse reactions occurring with medications, a new terminology, Cosmetovigilance is introduced for the surveillance of safety of cosmetic

products. "Cosmetovigilance" is defined as the activities related to the collection, evaluation, and monitoring of spontaneous reports of undesirable events observed during or after normal or reasonably foreseeable use of a cosmetic product.¹⁹ French health product safety agency has initiated the cosmetovigilance program as part of their pharmacovigilance program and now it is considered as a public health concept to address the safety of cosmetic products.^{19,20}

Some of the developed countries such as United States of America (USA) and Canada started the cosmetovigilance programs and encouraging the consumers and the health care professionals to report the cosmetics related adverse events. The program in Canada, is as per the Natural Health Products (NHP) Regulations started in the year 2004. In USA, Food and Drug Administration, Dietary Supplement and Nonprescription Drug Consumer Protection Act are some of the agencies supervising the cosmetic products.¹⁹

The proposed objectives for a cosmetovigilance program may be (i) to monitor the occurrence and predictors of undesirable effects caused by cosmetic products; (ii) to determine the nature and pattern of adverse cosmetic events; (iii) to assess the causality, severity and preventability of the adverse cosmetic events; (iv) to establish and develop corrective measures; (v) to conduct complementary assessments or studies relating to the safety of use of cosmetic products; (vi) to identify cosmetic products and/or ingredients which can present a risk for consumers' health.²¹

To conclude the causal association of the use of cosmetic product and the adverse events, many causality assessment methods are available and most of them are based on the semiological and chronological elements. The method used in France, AFSSAPS (French Health Products Safety Agency) categorise the adverse events into five levels: very likely, likely, not clearly attributable, unlikely, and excluded based on the semiological and chronological score. Another commonly used method, Colipa method divides the causality into 3, questionable, likely and very likely based on the interpretation of symptoms, chronology of the events and specific tests.⁶

Cosmetovigilance in India

India is a growing cosmetic market and majority of

the Indian population uses cosmetic products in their day to day life. Different dermatological problems such as dermatitis and dermatosis are common in India and cosmetic products also causes the same. There are reports of adverse cosmetic events to various Indian traditional cosmetics such as kajal, kumkum dermatitis are reported. It is the fact that proper use of a vigilance system of cosmetics can help to control or reduce the hazardous ingredients in cosmetic products. Hence, besides the regulations, a proper vigilance system similar to Pharmacovigilance/ meteriovigilance/ hemovigilance program of India, is also required for the population in India.

Acknowledgement

Authors would like to acknowledge the staff and students of Department of Dermatology, JSS Hospital and Department of Pharmacy Practice, JSS College of Pharmacy, Mysuru for their support in completing this review article.

Conflict of Interest: Nil

Source of funding: Nil

Ethical Clearance: Ethical clearance was obtained from the Institutional Human Ethics Committee of JSS College of Pharmacy, Mysuru.

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Tackling Covid-19: Critical Evaluation of India's Response

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Abstract

Today the entire world is observing an unprecedented health emergency due to the COVID-19 pandemic. Severely affected are the first world countries, which have the best of technology and healthcare infrastructure. Most of them, like Italy, the US, Spain and Germany, have seen exponential growth patterns. Despite the best possible efforts, almost no country has been able to flatten the curve convincingly. This pandemic is more challenging than its predecessors because it is highly contagious and roughly three-fourth of the infected people has not shown any known symptoms. The unavailability of quality testing kits makes early detection difficult. India has not seen the worst part of this evil as yet, possibly due to timely measures like behavioural interventions as well as movement and travel restrictions. Based on various studies that have been considered to develop this analysis, the mortality rate in India is around 3.2 per cent among the diseased, which is much less than the global rate. Due to drastic variations in public health infrastructure, demographic pattern and geography, the spread of the disease in India is, not uniform. The current restrictions have disrupted all economic activity, and the worst affected are the labourers and migrant workers. This is undoubtedly a testing time for India, but if we have to avoid under-preparedness in another similar situation, it depends on how India strengthens its public healthcare, legal and economic framework.

Keywords: COVID-19, Combat strategy, Community transmission, Healthcare infrastructure, Post-COVID-19 India.

Introduction

Having its first cases reported from the city of Wuhan, in central China, the 2019-nCoV has afflicted its wrath on over 210 countries and territories, causing 26,60,763 infections and 1,85,502 deaths already¹. Even the best healthcare experts and systems have been stunned by this pandemic's spread. Most of the countries affected by it, like Italy, the US, Spain and Germany, have seen exponential growth patterns which rendered their healthcare systems overwhelmed. Fortunately, to date, the rate of casualties in India is only 1.68 %².

Not long after China's first fatal case of coronavirus on January 11, 2020, India also confirmed its first case of the disease on January 30, 2020.

WHO (World Health Organization) declared this as a PHEIC (Public Health Emergency of International Concern) in the end of January 2020.³ On March 11, 2020, the WHO declared it as a "Pandemic". As per expert opinion, India is still in the early stages of an outbreak, and it is crucial to make predictions regarding the course this disease will follow. The diverse demographic and socioeconomic characteristics countrywide have led to a varied impact. The countrywide lockdown that commenced on March 25, 2020 was applauded as a commendable move made in just in time to curb the disease. This has reduced the number of cases significantly and prevented 'community transmission' of the disease. On the contrary, some areas have also reported infections without coming in contact with any positive case which hints the opposite. The

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cases in India are increasing every day by differential growth rates in different states. According to an analysis published on March 22 by the COVID-19 Study Group, a team of epidemiologists based in the US, India could see between around 100000 and 1.3 million confirmed cases of COVID-19 by the middle of May if the virus continues to spread at its current rate⁴.

Methodology

The study deliberates on the effect of COVID-19 worldwide with special reference to India's response to handling the crisis. Morbidity and mortality due to COVID-19 have not followed any uniformity in different parts of the world. This leads to a more in-depth analysis of reasons and consequences in different countries with a focus on India. The authors of this article have consulted many databases on COVID-19, and data were considered up till April 20 2020. Extensive subject literature, review articles and research papers were reviewed during paper development. Raw data from various databases like worldometer.com, covid19india.org, Indian Council for Medical Research (ICMR), Corona Virus Resource Centre, John's Hopkins, International Monetary Fund (IMF) among others were taken to study the global and Indian phenomenon. These databases are maintained and updated regularly, by various governmental and non-governmental agencies.

Study Findings

It is distressing that the world is observing an unprecedented health emergency. The worst-hit are those who have the best of technology and healthcare infrastructure. Despite the best possible efforts, almost no country has been able to flatten the curve convincingly. There are many quandaries about the economic impact and cost-effectiveness of the measures being used to tackle the disease. The national lockdown which now stands extended has been by far the largest worldwide and has quarantined a total of 1.38 billion Indians. If and when the country emerges triumphant over the virus, all its resources will be significantly drained, and the economy will be crippled. Despite the optimism of various international bodies regarding India, including the UN, the Indian economy will most likely reach stagnation if not a contraction, on the whole. Both, the Epidemic Disease Act of 1897 and the National Disaster Management Act

of 2005, pertaining which, the current restrictions are being imposed, are foggy on the matters of risk communication and crisis management in the country. Going by expert opinion, the current measures will not be feasible in the long term since it can only stop the spread of the disease and prevent a massive, unbearable outbreak.

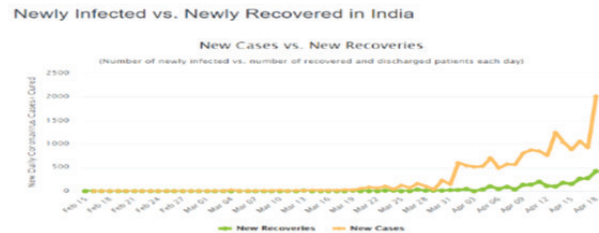
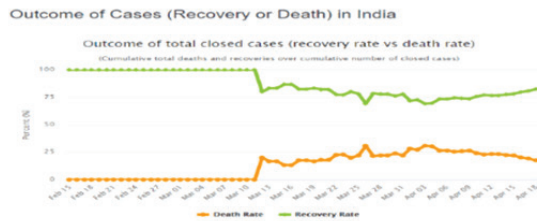
Three major reasons could explain the uncertainty of COVID-19's widespread. First, the highly contagious nature of the disease as compared to other viral diseases like influenza. A metric called R_0 (R-naught) explains contagiousness, which refers to the average numbers of people that one positive case infects. It is used to predict the extent and pace of disease spread. An R_0 of less than 1 implies a decreasing trend, while more than 1 depicts an increasing trend. R_0 value for COVID-19 is being estimated between 2.2 to 4.0 by different agencies. Secondly, it is challenging to identify and isolate COVID-19 positive cases because 75 – 80% of cases are asymptomatic, and they are called as 'Secret Spreaders'. These cases underwent tests only when they were suspected of having come in contact with COVID-19 positive cases. A total of 130 of 166 new infections (78%) identified in the 24 hours to the afternoon of Wednesday, April 1 were asymptomatic, said China's National Health Commission⁵. Scientists suspect there is an undetected pool of people who have mild or no symptoms, but they can infect others. Implications of asymptomatic cases infecting others are hazardous. Thirdly, the availability and quality of diagnostic testing kits that detect COVID-19 are questionable. The sensitivity and specificity of testing kits used for detection are crucial. Most of the countries are facing problems in acquiring accurate testing kits. An ideal diagnostic test should have reasonably high specific and sensitive value, which means that the test should correctly identify positive and negative cases, without reporting any false positives or false negatives. The RT-PCR kits being used currently, meet both criteria, with specificity and sensitivity rates of 90 per cent and above.

India's Response

The World Health Organization has commended India's robust and timely efforts to control the spread of coronavirus. There has been no community transmission of coronavirus since the country went into lockdown,

and the growth factor of cases has declined by 40%, according to recent statements by the Union Health Ministry⁶. The Ministry has stated that India will be following a strategic approach taking into account different possible scenarios – travel-related cases, local transmission of COVID-19, large outbreaks amenable to containment, and widespread community transmission of COVID-19⁷. The scenario of INDIA on COVID-19

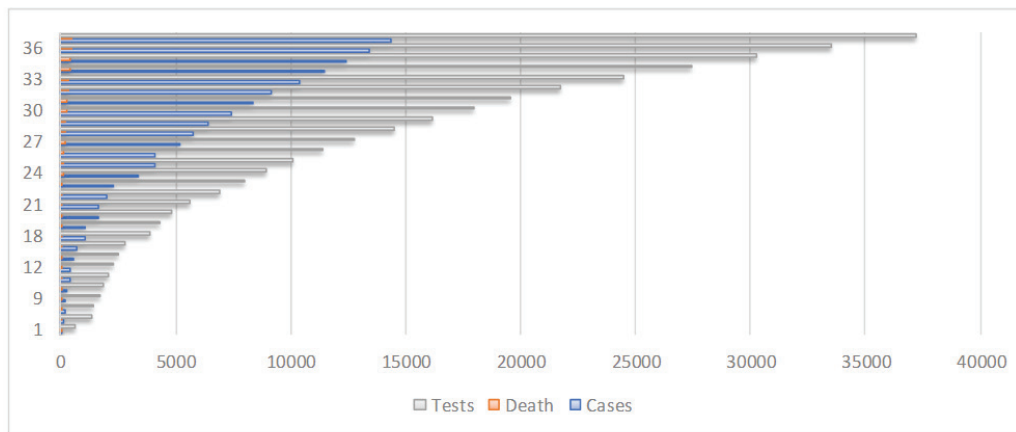
has decently better than other already affected countries, it's due to the precautionary measures⁸. At the same time, many experts believe that India could have done much better, had we taken necessary steps at the very beginning when the first few cases were reported. The current measures have successfully bought the healthcare system some time to be better equipped and put suitable strategies in place. India's doubling rate of COVID-19 positive cases has gone up from 3.4 days to 7.5 days.



(Source <https://www.worldometers.info/coronavirus/country/india/>)

In the first week of February 2020, India had three COVID-19 positive cases, but universal screening at the airports started nearly a month later. Most of our procurement process for Masks, Ventilators, PPE kits, Testing kits and other equipment started in the latter part of March when the positive cases already reached above 500. When the nationwide lockdown commenced on March 25, 2020, India already crossed 600 positive cases. Though India has not witnessed the USA or Europe-like spike in the cases, the number is still tickling. Unfortunately, there has been a history of under-reporting disease and death due to systemic deficiencies; Malaria and Tuberculosis are well-

known examples. It is often argued that a similar situation is highly likely for COVID-19 as well, given the fact that it is on the average a relatively mild infection, and many positive patients across India may be missed through misdiagnosis or missed diagnosis⁹. The states have also reported cases of people who were tested negative in airport screenings, which ascertains that ‘asymptomatic transmission’ was occurring since the very beginning. A paper published by scientists at ICMR, suggested that symptomatic people with no travel history should also be tested if India intends to delay the outbreak effectively¹⁰.

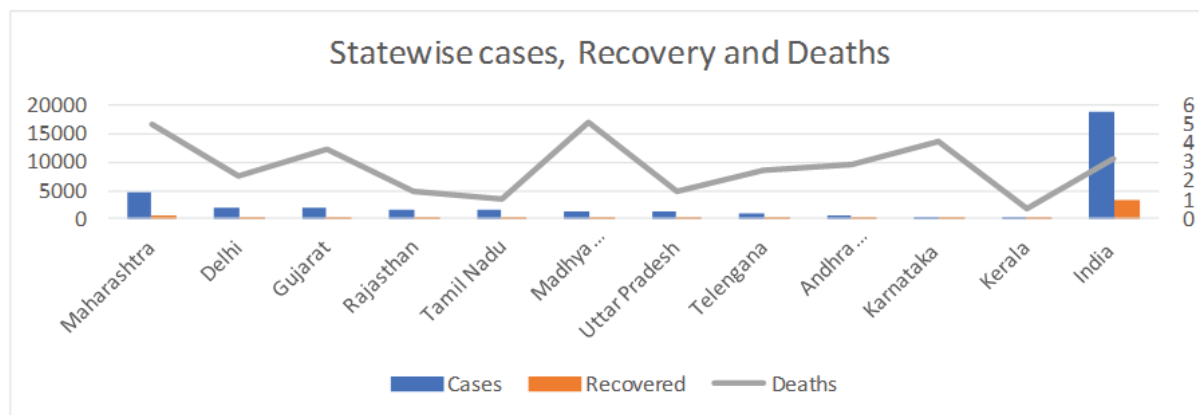


Graph 1: Day-wise total number of COVID-19 positive cases and deaths against tests performed (tests in ‘10)

(Source: icmr.nic.in)

India's testing numbers are drastically lower as compared to different countries worldwide. As of April 20, 2020, India has performed a little above 400,000 tests, bringing its Tests Per Million (TPM) ratio to around 291 tests/million population. This is far less than the global average. We can see from the graph that there is a strong relationship between

confirmed cases and test numbers. This could be a plausible explanation to why our cases are low. Notably, the death percentage among COVID-19 patient is 3.2 % compared to 6.9% globally. Death percentage among closed cases is 15% compared to 20% worldwide.



(Source: Covid19india.org) □

Graph 2: Number of cases, recoveries and deaths due to COVID-19 reported state wise

India had more than 650 deaths as on April 21, 2020, with over 20,000 confirmed COVID-19 patients. There is a vast difference in the number of cases, recovery, and deaths among different states of India, which highlights the way different states are dealing with this public health calamity. Maharashtra, MP, Gujarat and Karnataka have witnessed higher mortality rates than national average whereas southern states, Kerala and Tamil Nadu have less than 1% mortality rates. Kerala has managed to limit the cases with its extensive testing, followed by a detailed contact-tracing process and extended quarantine duration. Kerala faced a “potentially disastrous challenge” from the coronavirus, given the high number of expatriates and foreign tourist arrivals in the state¹¹.

From another perspective, the current movement and travel restrictions have adversely affected millions of people earning their daily bread in the unorganised workforce, The daily wagers are stranded and the growing insecurity has led them to travel back to their native villages, in search of a haven, also causing several

of them to die on the journey. Despite the government's measures to handle the crisis, like distribution of food on a massive scale or establishment of quarantine facilities, among others, still more needs to be done as this ‘humanitarian crisis’ continues to unfold in front of the whole world.

Furthermore, the long-prevailing of this pandemic may significantly increase the number of stress, depression and anxiety patients, and it will ultimately knock down the doors of other fatal human disorders¹². **Uncertainty and unpredictability are creating a more stressed environment which may increase the number of psychologically disordered patients¹³.** There should be a particular focus on the complications faced by the migrant women, who are inarguably one of the most vulnerable groups victimised by the virus. This mass exodus of the workers from bigger cities to their hometowns also poses the threat of community transmission of the virus in India.

Economic Impact

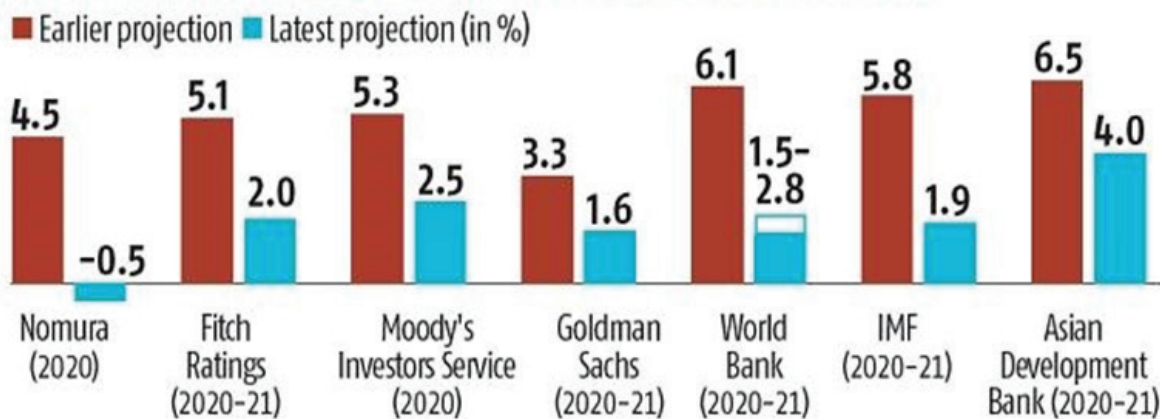
The post-COVID-19 India will be economically

weaker and financially frailer. Couple of months of social distancing and quarantine would have saved millions of lives but at the same time, it would have financially dented several million families¹⁴. Complete movement restrictions have resulted in no economic activity and contractions in many types of employment. Many sectors, like auto, construction, travel, hotel industry, have crashed. Depending on the nature of the industry, stock markets had already down by 25%. To boost the sentiments of the population, the finance ministry had rolled out a ₹1.7 trillion relief package towards food security and cash transfer, to tackle the loss of livelihood¹⁷. Last week, the Reserve Bank of India (RBI) cut the reverse repo rate, provided better liquidity support to non-banking finance and microfinance companies, facilitated increased emergency funding for state governments, among other

measures¹⁵. However, speculations point towards the need for more substantial financial support.

The International Monetary Fund (IMF) slashed India's growth estimate for FY21 to 1.9% from 5.8% estimated in January, warning that the "worst recession since the Great Depression" will dwarf the economic damage caused by the global financial crisis a decade back¹⁶. It also said that India and China would be the only two major economies likely to register positive growth, with all others contracting. IMF in its April 2020 update, said that the COVID-19 pandemic would shrink world output by 3% in 2020¹⁷. The growth forecast is marked down by more than 6 percentage points relative, an extraordinary revision over such a short period.

GDP GROWTH FORECAST BY VARIOUS AGENCIES FOR INDIA



Source: Respective agencies

(Source: [Businessstandard.com](https://www.businessstandard.com))

Conclusion

COVID-19 is highly contagious but less fatal compared to its predecessors and is not expected to be eradicated anytime soon. If we have to combat such a situation effectively, public health has to be prioritised on a national development agenda. The current efforts of the Indian government to contain the COVID-19 pandemic have been fruitful so far, but there are fundamental challenges ahead in health infrastructure¹⁸. It is a well-known fact that the investments in public healthcare provide considerable returns in the long term, all of which may not be measurable as direct economic

returns. The National Health Policy of India (2017) articulates increasing investment in health to 2.5% of the national GDP by 2025 from a meagre 1.15% in 2017. Even if complied with the National health policy, India's allocations stand far lesser than a large number of developing and developed countries¹⁹. COVID-19 has proven that a more significant increase in healthcare expenditure is direly needed. The allocated funds should establish comprehensive services without any further delay as the Indian healthcare system may crumble if the COVID-19 situation becomes like the USA or Europe. National Pandemic Preparedness Plans (NPPP)

were in place in all countries between 2005 and 2010 in anticipation of an influenza pandemic. We may use the same methodology with the required modifications in the context of COVID-19 pandemic. In a country like India, where health is a State subject, the NPPP needs to be replicated as State Pandemic Preparedness Plan (SPPP) as well. The pandemic can be turned into an opportunity if the country's macro-fiscal framework is revamped. Changes can also be made in the financial framework because India's overburdened financial system will soon impact smaller businesses also. All these issues can only be mitigated if adaptable, efficient and situation-specific strategies will be timely formulated and implemented.

Ethical Clearance: - Jamia Hamdard has two such committees namely, Institutional Animal Ethics Committee and Human Ethics Committee. The current study is based on various authentic databases, hence does not come under the purview of any committee mentioned above.

Source of Funding: - Self

Conflict of Interest: - Nil

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Best Remedy: Effective and Safe Therapy as Guided Imagery in Cancer Patients

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Abstract

Guided imagery is one of the powerful tool for relaxation of mind and body which convert into relaxed and calm state. It is a simple, safe and self-awareness technique used for the individuals or group of persons. Guided imagery have many health related benefits like relieve pain, nausea, stress, anxiety, lower blood pressure so on. And also strengthen the physical, mental, emotional well-being. **Method and Materials:** Different sessions, music, images, worlds, exercises is used by the therapist. The session starts with the relaxation, breathing exercise which helps to increase the attention of mind. In the technique the practitioner guide the clients and tell them to relax progressively of different parts of the body (Example- feat ankle, then knees and so on). **Result:** According to research studies the guided imagery is an effective or supportive therapy in Cancer patients as proved. By practicing guided imagery 20 to 30 minutes daily in their live it relax the mind as well as reduces the symptomatic problems like pain, nausea, stress, anxiety related to cancer. **Conclusion:** Guided imagery significantly reduces all the stressful stimuli and makes client with well relaxed and calm mind. Especially cancer patient who are fighting with cancer cells in their body showing maximum symptoms related to adverse effects of treatment. For cancer patients Guided Imagery is a best remedy supportive treatment or technique to relief from various problems which in turn make their life betterment with copying harmful crises.

Keywords: Guided Imagery, Relaxation, Mind, Body, Cancer Patients, Pain, Stress

Introduction

Guided imagery is one of the effective and powerful gentle techniques that focuses and guides the imagination. Many challenges face the practitioner or clinician in providing the supportive care to cancer patients. Guided imagery is a knowledge intervention that has been delivered with raising frequency as a curative option for many upcoming difficulties related to cancer patients. In this technique mind and body connection will take place and interact each other thus enhance the persons overall health and well-being. Guided imagery therapy uses words and images which help to divert the attention from the anxiety, stress, fear, pain and also strengthen the inner body naturally. In Cancer patient usually fights with disease related signs and symptoms such as pain, nausea, vomiting, stress, anxiety and fear. So Guided imagery is one of the best remedy to handle

these problems according to psychologists and physician tells that thousands of loyal immune cells come out of the thymus glands on identifying which intern destroy the unsuspecting cancer cells.¹

Definition:

1. According to the Achterberg Guided imagery is defined as the thought process that invokes and uses the senses, vision, audition, smell, taste the senses of moment, position and touch. It is one of the communication mechanisms between perception, emotion and bodily changes.²

2. According to many psychologist and physicians Guided imagery is also called as visualization. It is a technique in which a person imagines pictures, sounds, smells and other sensations associated with reaching a goal. Imagining starts in an situation or specific

environment that can activate sense of feeling effective by producing a physical or psychological aspects.²

History:

In the past 18th century Franz Mesmer introduced the hypnosis that the space to guided imagery. The ancient Greeks introduce the trance experiences which are used in vehicles for physical illness or mental illness. In 1950's the American Medical Association and the American Psychiatric Association identified the hypnosis as a formal tool. Over the past 25 years, the successful guided imagery has been introduced through research findings that show its positive impact on health, performance and creativity. Roughly 10 years later the guided imagery therapy was discovered through the integrated efforts of physicians and psychologist including Stephanie, Simonton and Carl, Roberto Assagioli, Lrving Oyle, Frank Lawlis, Jean Achtenberg and Rossman.⁴

The technique of psychodrama called Jacob Moreno's established in 1940's it is directly linked to guided imagery. In the year 1970's Dr Martin roseman and Dr. Bressler David have been developed for guided imagery as an ultimate approach for the treatment of cancer, chronic pain, stress, anxiety and serious mental illness. The discovered work has been came into the practice academy of guided imagery in 1989. In the 1980's throughout the number of health professionals like Ulrich, Lestie, Helen were started to publish materials related to effectiveness of positive responses of guided imagery on certain health illnesses like physical and mental aspects. Currently guided imagery is an effective developed therapy in alternative or complementary medicine and so many studies shows often helpful in therapeutic process.³

How Does It Help?

Since from 25 years the guided imagery is has been used in positive impact on health performance and creativity. In this technique the experts uses own imagery or before created listening to imagery that will enhance divert, edit, change or convert what is offered for and what is needed. So that guided imagery is a right-brained activity by using or practicing can reduce blood pressure, reduces cholesterol, pain etc. It mobilizes unconscious to pre-conscious process to act with

conscious goals, so it can convert much more individual strength and motivation to accomplish a desired end. Hence by using edit imagery it is an effective technique tells some research studies that reduces or relive the side effects of chemotherapy in Cancer patients that is nausea, vomiting, fatigue and stress.⁴

Mode of Action:

Early pioneers Green and Green, on guided imagery first research proposed psycho neurological theories related to imagery on healing. The researcher explain about mechanism of guided imagery that when the mind shuts it recreates an image of various emotional, physical or mental behaviour, a downward to upward self regulating feedback technique takes place. This process integrates the limbic system, cerebral cortex and hypothalamus which turn autonomic nervous system. When the patient stimulated in deep relaxation state the imagery sequence begins by creating mental image that influences the limbic system. Usually the pain stimuli are transferred through the substantia in the dorsal horn of spinal cord that act as gating mode. By use of guided imagery transmission of painful stimuli are closed at the gate before reaching maximum stage of conscious awareness.⁴

Levetal and J.Johnson proposed that patient experiencing a stressful condition may initiate coping actions which regulate action to both sensory stimuli, emotional and stressful stimuli which in turn reduces pain. Thus the mind is a measure tool and tremendous effect on the body. Example if you think about you that you are sleeping on the beach at Goa, your body responds and takes you in such as way that you're actually laying on the beach in Goa. As the positive imagery acts on body-mind and action takes place to relax by involving all the systems of the body.⁵

Procedure of Guided Imagery:

Hypnosis and guided imagery resembles same but in the guided imagery technique there is a communication between the guide and the client may occur but in hypnosis the interaction is not required. The procedure of guided imagery is usually starts and ends with 20 to 30 minutes. The session starts with exercise of relaxation which helps on focusing the attention of mind. In the phase of relaxation the guide stars teaching the client to

relax gradually at different parts of the body such as feet, ankle, and knees etc.⁶

The common dialogue is used in Guided imagery keep your eyes closed when you take a deep breath, and imagine by your own in the relaxation mood, beautiful thought makes you relax up. There are many ways to think for relaxation and peaceful. Example walks in the garden or spend a day on a beach. By this practicing relaxation will achieve through the active imagery that intense cope up with relieving the pain nausea, stress, anxiety etc. Guided imagery is an effective technique where we can use in all settings including individual or group. If once the procedure is learn it can be practiced independently without the guidance of the guide. Guided imagery Ready scripts or steps are available in the internet or books. The therapist uses various aspects of process which relax and connect the mind and body such as peaceful environment, nice aromas, silent sound and textures. Guided imagery is developed to impact the mind and the body, breathing techniques by controlling and relaxing the muscles thus it creates a state of calm and relaxed mood.⁷

Guided Imagery Sessions:

Guided Imagery can be obtained from home with the help of audio recording or books or by trained therapist. Guided Imagery can be practiced with individual or group sessions.⁸ The sessions complete in 20 to 30 minutes the guided imagery sessions are as follows:-

- e. The guider uses any one of the different guided imagery techniques that will enhance imagery experiences in the mind.
- f. The guider will direct you to imagine a place or situations that will enhance to feel relax, safe, peaceful etc.
- g. Guider uses melody music background that will enhance to help for avoiding mind distraction.
- h. The guider ask you to imagine something warm healing light on the area where the immune system attacking cancer cells. In this the other uses the exercise which is popular by involving picturing tiny pacman role which represents catching and eating cancer cells.
- i. The guider directs you to focus on imagined

situation that starts to experience feelings and sensations, such as lightness, strength, warmth or contentment.

Methods / Elements of Guided Imagery:

The physicians, psychologists and other health professionals are using guided imagery sessions in some cancer centers according to research studies the main method in guided imagery is as follows.

Ø **The Simonton Method:** Clients who are suffering from cancer they always fighting with harmful cancer cells. Here ask the clients to take relaxed regular breath deeply with imagination of soft cloud healing energy, and ask them to feel healing spreads full of the body.⁹

Ø **The Palming Method:** In this method colours are used for imagination, which each colour represents the different things. Ask the client to close their eyes with hands and imagine a colour that you feel. For example if the client is thinking brown colour on imagination that represents the fear. So when the client suffers from various problems like pain, anxiety, fear, stress, etc. The same client think of colour according to their condition so ask the client to imagine that present colour slowly and when healing process starts automatically the replacement of colour occurs and changes in imagination. By this method the symptoms will relief and the client feels relaxed and calm.⁹

Benefits of Guided Imagery:

It is a technique of sense of control which helps the individuals to feel relax and calm, when the situation feel out of control. There are following benefits of guided imagery they are as follows.¹⁰

- Ø Lowers blood pressure.
- Ø Improves shortness of breath.
- Ø Reduce feeling of depression.
- Ø Feeling of wellness.
- Ø Feeling of relaxed mind and body.
- Ø Diverts the attention from pain, stress, worry, anxiety. So that the symptoms can relieve.
- Ø Strengthen the inner body.

- Ø Reduces the nausea and vomiting.
- Ø Improve digestive and breathing problems
- Ø Creating the state you want.

Guided Imagery is Safe Technique?

Yes it is safe technique as per the various research studies. No known risk are identified with guided imagery. If the trainer of guided imagery teaches means it is proved that more effective than self practice.¹⁰

Requirement of Guided Imagery Practitioner:

1. Usually there is no formal licensing process for guided imagery technician. But some schools have training centers which gives guided imagery certificate.

2. Specially card imagery is intended for health profession such as nursing or psychotherapist who are already state issued license.

3. Full training hours required 90 to 200 hours.

4. You can get qualified guided imaginary practitioner through the Academy for guided imagery. The centre will train and give certificate of guided imagery which requires 150 hours of training period.

5. Health professionals, personal coaches, counsellors may adopt his training.¹¹

Criteria of Guided Imagery:

- Select a peaceful environment place and time which you feel convenient.
- Prior starting guided imagery technique tell your family members or surrounding not to disturb at all.
- When you are listening guided imagery audio or music avoid driving.
- Make yourself more comfortable where you are doing guided imagery procedure.
- Switch off mobiles.
- When starting to practice guided imagery the common thing may occur such as running nose, tears, yawning, muscle cramps or twisting.
- If you feel sleepy at the time of practicing

relaxation just leave it and choice any day for practice.

- Some unexpected thoughts or feelings may arise as imaginations while practicing guided imagery.
- Try to avoid worry or self decisions of getting it right.
- Day by day if you feel better relaxation, then you will be successful.¹¹

Supportive Studies:

Some of the clinical and research study shows that by practicing guided imagery the following aspects may able to:-

- Helps in healing of stress and depression.
 - Helps in increasing the number of immune system cells.
 - Helps in rest of mind and the body in relaxed stage.
 - Helps in reducing cancer related symptoms like pain, nausea, anxiety etc.
 - Helps in feeling of health with well being.
1. A meta-analysis of all the research articles published between 1980 to 2019 on the topic of knowledgeable strategies for pain relieving showed that more than 92% of the studies, cognitive interventions that are guided imagery, hypnosis and progressive relaxation techniques where significantly acts on reducing pain then no treatment. This study suggests that cancer patient facing poor quality of life due to treatment of chemotherapy and radiation. So the studies conducted on cancer patients by using relaxation therapy is to improve quality of life that chance physiological and psychological mechanism that combines together to control pain and related symptoms of cancer.¹²
 2. As study was conducted by Lyles et al on cancer patients practicing guided imagery felt less anxiety, distress, nausea and physiological symptoms related to chemotherapy. The study took 50 cancer patients receiving chemotherapy. Method used in this study is guided imagery and progressive muscle relaxation therapy for the session has been started by trainer by individually. Result reviles

that patient feels after guided imagery less anxious, controlled nausea, relieved pain and maintained blood pressure level.¹³

3. A study was conducted by Gruber et al to measure natural killer functions and response of lymphocyte with stage I breast cancer are 18 month period. Samples were trained with guided imagery and asked them to place themselves in relaxed setting. The result shows that significant effects of natural killer cells work with lymphocyte response. There is reducing of psychological symptoms like anxiety takes place and guided imagery become effective technique.¹⁴

Conclusion

Guided imagery is generally potential and safe beneficial technique in providing relief from symptomatic problems in Cancer patients. Guided imagery enhances cancer patients to relief from anxiety, pain, and nausea by using their own sensory imagination of relaxation. Usually in Cancer patients sedating medications will improve quality of life, so guided imagery is one of the best remedy which supports the life for betterment. Guided imagery will not reduce the disease condition but according to some studies shows that the cancer patients control over their lives in facing of crisis. If guided imagery techniques practiced by cancer patients in daily life means there will be positive physical and psychological conditions will improve ultimately intern that will be a good contribution to produce humanistic help in their fatal life in promoting positive directions with better being.

Ethical Clearance: is obtained from the Institution's Ethical Committee of Shri B.V.V.S., Sajjalashree Institute of Nursing Sciences, Navanagar, Bagalkot.

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Assessment of Self-Medication Pattern in Elderly

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Abstract

Objective: To analyze the prevalence and pattern of self-medication and the various socio-demographic factors that influence self-medication in elderly patients and also assess the impact of education intervention on self-medication knowledge, attitude in elderly patients. **Methodology:** A community based cross sectional study was conducted on Bangalore area such as Bellandur, Carmelaram, Kaikondrahalli and Naganahalli over the period of 6 months in 320 subjects. The demographic, clinical and social data were collected into specially designed case report form. The assessment of self-medication was carried out using modified structured questionnaire¹¹ on the day zero and 30. The patient education intervention was carried out on the day zero. The patient education intervention about self-medication was carried out verbally as well as by providing patient education information leaflets. Whenever they practiced self-medication they were asked to mark in the calendar and the data was analyzed. **Results:** The data on assessment of self-medication in elderly were collected from 320 study participants, a significant correlation was observed for elderly aged above 65 years aged above. Moderate correlation for economic status, education and occupation were found. Significant correlation was observed with medical history of the patient. Fever 66.25%, headache 54.68%, cough and cold 38.43%, were the most common illness where self-medication being used. Anti-pyretic 58.5%, anti-histamine 34.68%, anti-diabetic 19.68% were most commonly used self-medicating drugs. Pharmacist 79.30%, self-decision 30.93% and care takers 25% were the most common source for information about self-medication. Time saving 68.75%, no need to visit doctor for minor illness 61.25%, previous use of medication 55.93% and economic 53.43% were the major reason for self-medication. **Conclusion:** The results indicate that self-medication is widespread among elderly and 100% of elderly from the study population practiced self-medication without consulting the physician. The various factors like reason, indication and source associated with self-medication were analyzed during the study. A significant association between knowledge and attitude among the study population was drawn from the pre and post studies. The intervention will require better patient education of the public and health professionals to avoid the irrational use of drugs.

Key Words: Self-medication, KA, Community, Allopathic drugs, OTC, Elderly

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Introduction

The use of medications without prior medical consultation regarding indication, dosage and duration of treatment is referred to as self-medication as per world health organisation (WHO) ¹. This broadly includes referring old prescriptions, prescriptions of family members, obtaining medicines without

prescriptions, consulting friends and relatives etc or by sharing medicines². Self-medication moves patients towards greater independence in making decisions about management of minor illness, Improvement in people general knowledge, level of education, and socioeconomic status form a basis self-medication practices³. Some of the possible factors are the urge to self-care, lack of health services, poverty, ignorance, misbelieves, extensive advertisement of drugs and availability of drugs in establishments other than pharmacies. At times there is a possibility of nothing untoward happening upon following such advice, but it can still be quite dangerous⁴. Although OTC (Over-the-counter) drugs are meant for self-medication and are of proved efficacy² and safety their improper use due to lack of knowledge of correct dose, side-effects and interactions could have serious implications, especially in extremes of ages (children and the old age) and special physiological condition like pregnancy and lactation⁵. There is always risk of unknown interactions between active ingredients present in OTC drugs and prescription medicines as well as increased risk of worsening of existing disease pathology. Major problems related to self-medication are wastage of resources, increased resistance of pathogens and health hazards such as adverse reaction and prolonged suffering⁴. Self-medication with OTC medicines may initially result in reduction of distress but in long run, it may lead to serious issues like allergy, habituation, addiction, poisoning and depression⁶. Various studies reported that self-medication may lead to delay in care seeking which results in paradoxical economic loss due to delay in the diagnosis of underlying conditions and appropriate treatment. Studies of such nature will provide useful insight on the reasons for which people resort to this practice and might help the policy makers and regulatory authorities to streamline the process of drug regulations, updating the list of essential medicines and safety issues of over the counter drugs¹¹.

Materials and Methodology

A community based descriptive interventional study was conducted in Bangalore areas such as: Bellandur, Carmelaram, Kaikondrahalli and Naganahalli over a period of 6 months. The study was conducted on 320 subjects after gaining approval from the institutional ethical committee. The elderly patients who are of either

gender aged 65 years and above who satisfy the study criteria were enrolled after taking their informed consent prior to the study and those elderly patients who were not co-operative were excluded. The demographic, clinical and social data were collected into specially designed case report form. The assessment of self-medication was carried out using modified structured questionnaire¹¹ on the day zero and 30. The patient education intervention was carried out on the day zero. The patient education intervention about self-medication was carried out verbally as well as by providing patient education information leaflets. Whenever they practiced self-medication they were asked to mark in the calendar. The result of the study was analyzed using appropriate statistical methods (Chi square test and Pearson's correlation).

Ethical Clearance- Human ethical clearance was obtained for carrying out the research work from ethical committee of MVJ Medical college & Research Hospital Hoskote with ethical clearance number-sMVJMC&RH/ECM/2018-19.

Source of Funding- Self funding

Conflict of Interest - Nil

Results

A total of 320 subjects were interviewed in the study period of 6 months and all the subjects took medicines with- out medical practitioners advice in different forms. The following evaluations were made from the observed data.

Socio-demographic Characteristics

Out of 320 subjects who practice self-medication , 122 (38.1%) were male and 198 (61.8%) were females.

Educational Status

Out of 320 subjects 48 (15%) were literate and 272 (85%) were illiterate. Hence illiterate subjects were consuming more self-medication compared to literate subjects.

Occupational Status

A total of 320 subjects, 245 (76.5%) of them were dependent , 40 (12.5%) were pensioners and 35 (10.9%)

were working.

Economic Status

Out 320 subjects 11(3.43%) were having annual income less than 1 lakh, 114(45%) were having annual income between 1 lakh -2 lakh ,109 (34%) were having annual income between 2 lakh – 3 lakh , 68 (21.25%) were having annual income between 3-4 lakh and 17 (5.31%) were having annual income greater than 4 lakhs.

Marital Status

Out of 320 subjects, 261 (81.56%) were married, 49 (15.31%) were widow/widower and 10 (3.12%) were unmarried.

Medical History

Out 320 subjects, 306 (95.6%) were having some or the other medical history and 14 (4.37) were not having any sort of medical history.

Categories of Drugs Commonly Used

Describes commonly used category of drugs for self-medication in this particular population. Hence the percentage for the category of self-medicated drugs is given as follows. 58.5% used antipyretic , 34.68% used anti-histamine, 19.68% used anti-diabetic, 18.43% used analgesics, 15.31% used anti-hypertensive, 12.8% used antibiotic, 10% used anti-thyroid, 7.81% used NSAIDS, 5.6% used anti-diarrhoeal, 5% used Proton pump inhibitor, 3.1% used anti-asthmatic and 2.18% used anti-emetic.

Factors Leading to Self-Medication Practices

- **Reasons for practicing self-medication**

Out of 320 subjects, 68.75 % practised self-medication as it was time saving. 61.25%stated that they practiced self- medication as they considered that no need to visit doctor for minor illness.55.93% were consuming self-medication by previous use of medicines.53.43 %were practicing self –medication as it was economical. 50.31 % were practicing as it was ease and convenient.6.25% were having fear of medical check-up and 1.25% were practising based on confidence of their knowledge about medicines.

- Various indication for which self-medication is practiced

The below table shows the common indications for which study subjects usually take self-medication. Fever (66.25%) is the most common indication for which majority of the subjects took self-medication. Followed by Headache (54.68%), Cough/ Cold (38.43%), Pain (26.56%) Constipation (21.56%), Diarrhoea(10.93%), Stomach ache (4.37%) and Vomiting (4.37%).

- **Various source of information about self – medication**

From this study, majority of the study subjects (79.30%)obtained information from pharamacists ,while (30.93%) procured medicines based on their self– decision, followed by care takers (25%) ,relatives(21%), friends (18.75%) ,Health care provider but without prescription (17.18%) and advertisements (11.25%).

KNOWLEDGE ON SELF-MEDICATION PATTERN (Pre K1 and post K2)

As per the questions (pre & post) on knowledge posted to the study subjects following data were obtained.

Knowledge Questions	P value
It appropriate to consume self-medication at your age?	<.0001
Is it appropriate to take self-medication without consulting the physician?	<.0001
Do you think self-medication can be harmful?	<.0001
Are you confident about how to take self-medication?	<.0001
Are you confident about when to take self-medication?	<.0001
Do you know for what all indications self-medication can be taken?	<.0001

ATTITUDE TOWARDS SELF-MEDICATION (Pre A1 and post A2)

As per the questions (pre & post) on attitude posted to the study subjects following data were obtained.

Attitude Questions	P value
If you are not sure about self-medication, you have to check with the doctor?	<.0001
It is acceptable to use self-medication for short a period of time?	<.0001
It is safe to use several medicines at the same time, if each one was prescribed for a different symptom?	<.0001
It is acceptable to self-medicate to treat chronic illness?	<.0001

It is acceptable to use previously prescribed drugs to treat the recurrent attacks of chronic illness?	<.0001
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Discussion

The present study was conducted among geriatric population of either gender aged 65 yrs and above, who were practicing self-medication. The study period was of six months and 320 subjects were enrolled in the study after taking their consent. a questionnaire based descriptive cross-sectional study on self-medication pattern among elderly which was completed based on the information given by the subjects. This group of subjects were expected to share the same experience with respect to Age, gender, education, occupation, economic status, marital status and medical history. Hence an attempt was made to assess the effect of socio-demographic factors on self –medication pattern in elderly¹³. This study reported that consumption of non-prescription drugs by the subjects were 100 % and these drugs were consumed by the subjects without following any recommendations about their doses and duration .It is a general assumption that gender doesn't play a role in self-medication practice. According to our current sample population, we had a higher number of female subjects (61.8%) as compared to male subjects (45%). however some of the similar studies indicated that prevalence of self-medication practice were higher in males than females, as males are economically stronger and easily access the medical store and freely move outside¹². This study indicates high prevalence of self-medication among illiterate i.e. 85% when compared to literate subjects i.e. 15 %. Education of the subjects was found to be the major factor influencing the practice of self-medication in various studies including the present study^{9, 13, 12}. Another factor was found to be occupation

in which the subjects were categorized into dependent, pensioner and working. Out of which 76.5 % subjects who were dependent opted for self-medication, 12.5% of pensioner practiced self-medication and subjects who were working 10.9% were consuming self-medication. Another finding with respect to marital status were that unmarried subjects obtained their medication from hospital rather than medical store ,where as widow/ widower and married subjects opted for self-medication practice due to financial crisis. Medical history is another factor which influences the subjects to opt for self-medication practice. Majority of the subjects with medical history have opted for self-medication practice compared to subjects without any medical history. As the number of disease condition arises more number of medication is required which may be concern for the subjects with low economic status. The increase in self-care is due to a number of factor socioeconomic factors , ready access to drugs, the increased potential to manage certain illnesses through self-care ,public health ,demographic and epidemiological factors.¹⁴ The most common category of self-medicated drugs in the study population were antipyretic , anti-histamine, anti-diabetic, analgesics, anti-hypertensive, antibiotic, anti-thyroid, NSAIDS, anti-diarrhoeal, PPI and anti-asthmatic. The most common reasons for self-medication in the study population were that no need to visit doctor for minor illness, previous use of medicines, economical, ease and convenient, fear of medical check up and confidence of their knowledge about medicines. The most common indications for which self-medication were practiced among the study population were Fever,

Headache, Cough/ Cold, Pain, Constipation, Diarrhoea, Stomach ache and Vomiting. The various sources from which study population obtained information regarding self-medication were Pharmacists, self –decision, followed by care takers, relatives, friends, Health care provider but without prescription and advertisements .As per the protocol the subjects were posted with questions to assess their knowledge and attitude on self-medication. The knowledge and attitude of the subjects were assessed by asking questions interspaced with intervention i.e. (education intervention).After which the same question were again posted with same choices and were recorded to ascertain quantum of change based on the choices made by the subject pre and post intervention were posted in contingency table and the quantum of change with respect to hypothesis was tested using likelihood ratio and Pearson’s correlations. All contingency tests were done at a confidence interval of 95%.

Ethical Clearance: MVJ Medical College and Research Hospital Ethical Committee.

Funding: Self

Conflict of Interest: NIL

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Cognitive Behaviour Therapy for Children with Dental Anxiety: A Review

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Abstract

Cognitive behavioural therapy (CBT) is a non-pharmacological technique that uses a combination of behavioural and cognitive coping skills, for behaviour guidance during dental treatment of children. It is a structured psychological treatment method, which features behaviour analysis, psychoeducation, exposure, cognitive re-structuring, assertiveness techniques, and home exercises. Although the specific components of CBT differ depending on the study design and the anxiety disorder treated, through this review we aim to review the CBT procedures (particularly exposure-based approaches) and its efficacy in paediatric dental practice. We also illustrate the outcomes of various studies that compare the traditional behaviour management techniques with CBT. It may be concluded that CBT has a higher success rate when compared to other behaviour guidance techniques, with good patient and parental acceptance.

Keywords: *Pediatric, dental anxiety, cognitive behaviour therapy, psychological.*

Introduction

Children are not merely a miniscule form of adults, but are constantly undergoing changes mentally, physically and emotionally. Psychologically, their development proceeds in a sequential manner, which is evident in their various characteristic behaviours⁽¹⁾. Among children who come for a dental treatment, dental anxiety is often coupled with oral health problems such as untreated dental caries⁽²⁾. This may lead to negative corollaries such as feeling of mortification, decreased self-confidence, and absenteeism from school⁽³⁾.

For a dentist, managing children with anxiety or behaviour problems is a dual mission: first, to treat the dental problem the child is experiencing; and second, teaching the child effective ways to manage dental anxiety⁽⁴⁾. It is known that, cognitive behaviour

therapy (CBT) is useful in managing dental anxiety and phobia in adults. The technique of CBT coalesces the behavioural (desensitisation and relaxation) and cognitive (cognitive restructuring) interventions⁽⁵⁾.

The principles of operant conditioning are used for behaviour therapy. Functional analysis via observing and recording the events prior to and during the occurrence of the behaviour, and the outcomes is carried out to operationally identify the behaviour to be changed. Post analysis, treatment is based upon the principles of operant conditioning theory, including positive and negative reinforcement, punishment and shaping. Caregivers are involved, to significantly raise the chance of success of the behavioural mediation⁽⁵⁾.

Cognitive therapy is based on the principle that, maladaptive cognitions cause emotional distress and behavioural problems. The therapeutic strategies aim to change these maladaptive cognitions⁽⁶⁾.

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Assessment:

The assessment model by Williams et al⁽⁸⁾ has five areas:

1. Situation, relationships and practical problems:

Various children face practical problems in various situations, and the activities of people around them can create emotional upsets and complications.

2. Altered thinking: Unhelpful thinking styles like jumping to the worst conclusion or having negative thoughts of future may occur in anxious children.

3. Altered emotions: Emotions such as feeling low, anxiety, worry, stress, fear, panic, etc as well as having guilt or feeling of embarrassment.

4. Altered physical symptoms: Patient exhibits signs such as restlessness or inability to relax in an operatory.

5. Altered behaviour: Signs like avoidance or reducing socialising with peers could be one of the signals of depressed state of the child.

Indications: ⁽⁹⁾

a. Depression: mild; moderate to severe (treatment with anti-depressants), relapse cases.

b. Generalised anxiety disorders, not responding to other behaviour management techniques.

c. Normal children with anticipated anxiety for a dental visit ⁽¹⁰⁾.

Description of the technique:

CBT aims to teach patients to be their own therapist, help them recognize their existing ways of thinking and behaviour, and provide them with the tools to modify their ill-adapted cognitive pattern. To understand the intervention, a brief understanding of the cognitive-behavioural model is essential ⁽⁹⁾.

The cognitive-behavioural model proposes that three layers of cognitive dysfunction occur in individuals struggling with social and/or psychological problems namely core belief, intermediate belief and automatic thought. Core beliefs grow early in life and represent rigid conceptions of self, others, and the universe. Individuals with negative core beliefs are likely to develop depression or anxiety compared to individuals with positive core beliefs. These can be passive and may not influence the life of a person, until a stressful situation occurs ⁽¹⁰⁾.

An automatic thought is a conception about others, and ourselves at certain situations that occur throughout the day. Maladaptive automatic thoughts are skewed representation of a situation, often accepted as true. CBT aids the child to become conscious of these automatic thoughts and learn to challenge, analyse and amend these thoughts ⁽¹¹⁾.

Intermediate beliefs are attitudes individuals follow in their life based on conditioning. They build these attitudes by categorizing the information they receive from the world around them. These laws direct thought and affect behaviours ⁽¹⁰⁾.

With the concept of “C” in CBT clear, we now move on to the “B”, the behaviour aspect of the model. As changes in thought and behaviour go hand in hand, by changing the direction in which a person thinks about a situation, the behaviour will also change. The therapy uses various coping approaches and techniques to relieve anxiety such as:

A. Self-monitoring: By keeping track of problems. Individuals become more conscious of the situations that appear to “activate” their anxiety.

B. Exposure therapy: Aims to diminish the fear of certain objects (e.g., injection syringe) or situations (e.g., injecting local anaesthetic) by gradually increasing the exposure to the feared object or situation. Initially, the child is asked to look at images of the scary objects or circumstances (indirect exposure) and then gradually increase the exposure until they can experience the object or feel the situation (direct exposure) and remain in contact until the anxiety level is diminished ⁽¹²⁾.

The most essential component of this therapy is establishing a good relationship with development of trust and collaboration between patient and therapist, both working as a team. Effective communication is a key factor. A second component is gradual and controlled exposure to a hierarchy of anxiety-provoking thoughts connected to dentistry ⁽¹³⁾. For example, if the anxiety provoking stimuli is the application of an injection, the following method can be applied ⁽¹⁴⁾:

1. In the preliminary session, establishment of a good therapeutic relationship. Exposure to the syringe, towards having the needle in the mouth.

2. In the second session, repeated penetration of the mucosa, at different places in the mouth after topical anaesthesia application.

3. In the third and the fourth session, injection of anaesthetic liquid at different places in the mouth, first a few drops, then the amount is increased.

4. In the final session, further exposure is attempted; the patient's catastrophic thoughts are reevaluated in connection to exposure.

Catastrophic and anxiety related thoughts that are elicited during the exposure to the anxiety-provoking situation are overcome by cognitive restructuring. This helps the patients gain adaptive perspectives and behaviour⁽¹³⁾.

In another technique used by Shanavaz et al⁽¹⁹⁾, children, caregivers and psychologist met for ten hours of CBT over a period of 11 weeks. These sessions included behavioural analysis, psychoeducation, caregiver education, access to both in vivo and videos of dental procedures, relaxation techniques, knowledge on surgical pain control and cognitive reformation. During the sessions with psychologist, patients were exposed by viewing a mini movie presenting a child going through various dental procedures. There was provision for the children and caregivers to use dental tools and materials such as a probe, cotton balls, topical gel, suction tip, and needle to exercise at home. The therapy successfully helped to improve the patient's ability to manage dental procedures, increase self-efficacy, and decrease anxiety associated with specific dental procedures.

Kebriae et al⁽¹⁷⁾ elucidated another technique of applying CBT as follows:

Step 1: Establishing the rapport- during the 4 min in a playroom, children played with a drawing slate, colour pencils, clay, and play items like dolls and toy cars.

Step 2: Modelling phase- A movie of a 5-year-old child happily undergoing dental procedure with a cooperative behaviour was shown, and the emphasis was on the child's happiness during treatment.

Step 3: Use of Benson relaxation technique- With a glove puppet in the dental practitioner's hand, the Benson's breath method was taught wherein the hand of

the dental practitioner was put on the child's abdomen, the child was instructed to blow it with air like a balloon, hold it for two seconds and gradually release it in about four seconds.

Step 4: Cognitive phase- Positive emotions and feeling were reinforced verbally. The dental practitioner explained to the child that by un-filling the balloon (stomach), all the fear and concern regarding dental treatment will be drained. Self-talking by means of reinforcing positive sentences was encouraged. This activity was continued in the dental operating room, during the injection of local anaesthetic, rubber dam placement and use of high-speed handpiece.

Thus, a trained dentist or a psychologist can modify the CBT intervention to suit the patient.

Comparing CBT with other techniques:

In a study by Berge et al⁽¹⁴⁾, 67 children aged between 10-16-years with intra-oral injection phobia were subjected to CBT. Group I received CBT 1 week after the diagnostic interview and Group II waitlist-control group who were waitlisted for 5 weeks, post which they were transferred to the first group. The patients completed the psychometric self-report instruments in the waiting room, prior to a semi-structured diagnostic interview by a clinical psychologist. The intervention included five CBT sessions. Cognitive restructuring followed cognitive analysis of the patients' catastrophic thoughts concerning the anxiety-provoking stimulus. Behaviour avoidance test (BAT) was done to test the catastrophic cognitions and counter-productive beliefs. The CBT was adjusted to the maturation and developmental level of each individual patient. Valuations included the psychometric scales on dental fear and phobia followed by a questionnaire on cognitions, which were carried out before, after-treatment/waitlist and at one-year follow-up. There was a significant improvement in all the psychometric scores for fear and anxiety for group I, compared to group II. The BAT scores for Group I was better than that of group II. The findings were preserved at one-year follow up. It was concluded that 10-16-year-olds with intra-oral injection phobia benefit through CBT performed by specially trained dentists.

In a study by Shanavaz et al⁽¹⁹⁾, thirty children aged between 7-18-years were segregated into two groups namely CBT group for ten sessions rendered by a trained psychologist and the group where treatment was done through basic behaviour guidance interventions, sedation with midazolam, or general anaesthesia. The BAT, Structured Clinical Interview for Dental Anxiety (SCI-DA) and other psychometric tests were used. The BAT scores after the procedure and at a follow-up of one year showed that children in group I tolerated dental procedures better than group II. Further SCI-DA showed that the CBT group did not match the criteria for dental distress at one-year follow-up. The other psychometric scores also showed a drop in anxiety and increased self-efficacy in group I.

Kebriaee et al⁽¹⁷⁾, studied 43 children aged between 3-6 years, for comparing the efficacy of inhalation sedation with nitrous oxide/oxygen (N₂O/O₂) and CBT in plummeting dental anxiety with a control group. For the controls, behaviour intervention methods used were tell-show-do, voice control, positive reinforcement, distraction and non-verbal communication. CBT in the form of unrelated play, Benson's breathing, positive self-talk and modelling were employed. Distress level and cooperation were determined at three intervals: injection, dam placement and high-speed airtor use with anxiety scales. Both N₂O/O₂ sedation and CBT resulted in significantly lower anxiety and higher cooperation in the second visit (at all three intervals) compared to the control, with no significant difference between these two treatment methods. CBT was recommended over N₂O/O₂ as it does not require equipment, with no chance of adverse effects⁽¹⁷⁾.

Parental and child acceptance of CBT:

There is limited knowledge on how the children and caregivers perceive CBT in dental practice. In a study by Shahnavaaz⁽²⁰⁾ et al, children and parents were questioned on emotions, thoughts, and experiences related to CBT and the anticipated result of the therapy, as children experienced an improvement in their ability to handle the dental procedure as well as the reduction in anxiety following CBT. The results showed that children and their parents perceived CBT as a positive event.

Age, gender and ethnicity influence on the intervention:

There is a dearth of studies related to the influence of age, gender and ethnicity on the use CBT in dentistry. Most of the studies include children above the age of 10 years, as the effectiveness of the therapy depends on the cognitive development of the child^(14, 21). In a study by Morgan et al⁽²¹⁾, recruiting participants from certain population groups, particularly male adolescent participants belonging to ethnic minority groups was challenging. This may be due to social and cultural obstacles to accepting dental distress, willingness to take part in interviews, and language difficulties.

A study by Strom et al⁽²²⁾ showed that, the behaviour management technique most frequently used by pediatric dentists when treating patients with dental anxiety was tell-show-do, followed by relaxation, distraction, CBT and lastly conscious sedation.

Advantages and Limitations:

CBT is a structured, problem-centric and objective-oriented behaviour guidance strategy that uses tested approaches and skills that have been used to treat anxiety disorders. Although its effectiveness in dentistry is evidence based, it requires special training by the dentist or presence of a psychologist who is adept in CBT. CBT approach may not be suitable for all children, particularly those who have poor cognitive abilities or who are unwilling to engage with the guided self-help CBT approach. For children with more severe dental anxiety, guided self-help CBT alone may not be enough and pharmacological approaches should be incorporated.

Conclusion

Research on CBT demonstrates that it is an effective treatment, which been adapted for use with children with anxiety and depression in a pediatric dental set up. Further, randomized controlled trials are required to determine the factors influencing the outcome and cost-effectiveness of CBT as compared to other behaviour guidance techniques for various age groups. It may be concluded that CBT has a higher success rate when compared to other behaviour guidance techniques with a good patient and parental acceptance.

Ethical Clearance- There were no ethical issues/concerns in the making of this review.

Source(s) of support- Nil

Conflict of Interest – Nil

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Assessment of Infrastructure and Logistic at Anganwadi Centers in A Block of Ganjam District, Odisha

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Abstract

Introduction: The ICDS scheme provides a package of services to different groups of the target population. These services are provided through the frontline honorary workers called as anganwadi workers (AWWs). The anganwadi centre (AWC) is the focal point for delivery of these services. **Objectives:** To assess the infrastructure and logistics at anganwadi centres in a block of Ganjam district. **Materials and Method:** This was a cross sectional study conducted from October 2016 to October 2018. Multistage random sampling was used to select the AWCs. By using table of random numbers, 24 AWCs were selected out of 239 total AWCs in Chatrapur block. **Results:** All the AWCs were found to be located within the village. 75% AWCs were functioning in their own buildings. 95.8% AWCs were pucca houses. 54.2% AWCs were hygienic. Adequate lighting and proper ventilation was present in 75% AWCs. 66.6% of AWCs had adequate indoor space. Outdoor space was available in 45.8% AWCs and 41.7% AWCs had storage space. 91.7% AWCs had toilet facility and all AWCs had electricity supply. Piped water supply was available in 75% AWCs. 25% AWCs lacked separate kitchen space. Chairs, table, mat, PSE material, growth charts, medicine kit and utensils were available in all the AWCs. MCP Card and posters were available in 95.8% AWCs. Salter weighing machine and adult weighing machine in working condition were present in 95.8% and 83.3% AWCs respectively. **Conclusion:** Even though there is improvement in the infrastructure and logistic supplies in the recent years, still it is not satisfactory i.e. 100%. Strengthening of the basic infrastructure of AWCs should be emphasized.

Keywords: Anganwadi centers, Infrastructure, logistics, ICDS

Introduction

Children are the future and valuable human resource of a country. The topmost agenda for human resource development is the health and welfare of children because they are most vulnerable and also the foundation of basic learning and human development is laid in these crucial years of life.¹ Child survival, growth and development, should be checked out as a holistic approach, as one component cannot be achieved without achieving the other two. For proper development of a child there should

be a balanced linkages between education, health and nutrition.² For economic development of any country, they have to invest in the health and welfare of children as it is considered that “children are supreme asset for human resource development”.³ Having realized this, specific programmes have been conceptualized and implemented since early fifties in India.

ICDS scheme was launched on 2nd October 1975 by Government of India. The main purpose of this scheme was to improve maternal and child health. The ICDS scheme provides a package of services to different groups of the target population comprising of children below the age of six years, pregnant and lactating mothers, women in the reproductive age group (15-44 years) and adolescent girls (11-18 years). These beneficiaries receive integrated package of services like supplementary nutrition, preschool education,

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immunization, health check-up, referral services and nutrition and health education. These services are provided through the frontline honorary workers called as anganwadi workers (AWWs). The anganwadi centre (AWC) is the focal point for delivery of these services.

ICDS is successfully running in Odisha. As on September 2019, there are 338 operational ICDS projects and 72587 operational AWCs/Mini AWCs in Odisha. There are 3662662 beneficiaries for supplementary nutrition and 1388638 beneficiaries for pre-school education.⁴

Even after more than 40 years of its implementation, the changes produced by ICDS are not upto the expectations. Service delivery by the anganwadi centers are still not upto the mark. This may be because of varied reasons like poor infrastructure of the anganwadi centers, poor logistics, inadequate knowledge, lack of proper training and poor remuneration to the AWWs. Poor infrastructure can hamper routine activities of anganwadis; can cause health problems of both service providers and beneficiaries and also lead to loss of beneficiaries. Therefore, the current study was planned to assess the infrastructure and logistics at anganwadi centres in a block of Ganjam district

Materials and Method

This was a cross sectional study conducted from October 2016 to October 2018. Multistage random sampling was used to select the AWCs. There are 22 blocks in Ganjam district. In the first stage one block i.e. Chatrapur was selected randomly by lottery method. Then a list of all AWCs in Chatrapur block was obtained. It was decided to include 10% of AWCs for the study purpose keeping in view the constraint of time. By using table of random numbers, 24 AWCs were selected out of 239 total AWCs in Chatrapur block. After obtaining clearance from IEC, permission was obtained from CDPO. In each of the selected AWC, AWW and AWH were contacted. The nature and purpose of the study was explained to the AWW. The study was carried out with AWW consent and cooperation. Data was collected by visiting the anganwadi centers. The infrastructures of the anganwadis were assessed using a pre-validated checklist. The data were entered and were analyzed using the statistical software SPSS version 17. Rates and proportion were calculated.

Results

Table 1: Location and ownership of AWCs (n = 24)

Location and ownership of AWCs	Number (%)
Location of AWCs	
Within the village	24 (100)
Outside the village	0 (0)
Ownership of AWCs	
Own building	18 (75)
Rented	4 (16.7)
Other government building	2 (8.3)

All the AWCs (100%) were found to be located within the village. Out of 24 AWCs, 18 (75%) were functioning in own buildings, 4 (16.7%) were functioning in a rented premise out of which one was the AWW house while remaining 2 (8.3%) were functioning in other non-allotted government buildings like school or panchayat building.

Table 2: Condition of AWCs (n=24)

Condition of AWCs	Number (%)
Physical condition of building	
Pucca	23 (95.8)
Kuccha	1 (4.2)
Surrounding of AWCs	
Hygienic	13 (54.2)
Cattle Shed	3 (12.5)
Garbage dump and open drains	8 (33.3)

Majority of anganwadi centers (95.8%) were pucca houses. Assessment of area surrounding the AWCs revealed that 54.2% centers were free from any nuisance causing factors. Cattle shed was seen near 12.5% AWCs and garbage dump or open drains were present near 33.3% centres.

Table 3: Availability of essential amenities at AWCs (n=24)

Essential amenities	Available Number (%)
Sign board in local language	21 (87.5)
Adequate lighting	18 (75)
Proper ventilation	18 (75)
Adequate indoor space	16 (66.6)
Outdoor space for play	11 (45.8)
Storage space	10 (41.7)
Toilet	22 (91.7)
Electricity	24 (100)
Piped water supply	18 (75)
Separate kitchen	18 (75)

Sign board was displayed in local language in 87.5% of the AWCs. Adequate lighting and proper ventilation was present in 75% AWCs. 66.6% of AWCs had adequate indoor space for conducting the pre-school activities. Outdoor space for play was available in 45.8% AWCs and 41.7% AWCs had storage space. Majority of the AWCs had toilet facility (91.7%) and electricity supply was seen in all AWCs (100%). Piped water supply was available in 75% AWCs. 25% AWCs lacked separate kitchen space.

Table 4: Availability of equipments and supplies at AWCs (n=24)

Equipment and supplies	Available Number (%)
Chair, Table, Mat	24 (100)
Almirah/box	22 (91.7)
Salter weighing machine	23 (95.8)
Adult weighing machine	20 (83.3)
MCP Card	23 (95.8)
Growth charts	24 (100)
Posters	23 (95.8)
PSE materials	24 (100)
Medicine kit	24 (100)
Utensils	24 (100)

Chairs, table, mat, PSE material, growth charts, medicine kit and utensils were available in all the AWCs (100%). MCP Card and posters were available in 95.8% AWCs. Salter weighing machine and adult weighing machine in working condition were present in 95.8% and 83.3% AWCs respectively. Almirah/box for storage of equipments and supplies were available in 91.7% AWCs.

Discussion

An Anganwadi Centre should be located within the village as it is the focal point for delivery of all the services under ICDS programme in an integrated manner to children and women. In the present study all the AWCs were found to be located within the village but only 75% AWCs were functioning in their own buildings. When AWCs do not have their own buildings along with adequate infrastructure they cannot render service properly. Similar results were found in a study conducted by Debata et al where all the AWCs were located within the village.⁵ However in a study by Sahoo et al in Khorda district of Odisha 83.3% AWCs were within the village.⁶ In an evaluation study conducted in 2011 by Planning Commission it was reported that 53.5% AWCs in Odisha were functioning in their own building.⁷ In studies conducted by Sarbjit SK in Punjab, Sembiah et al in West Bengal and Rathore et al in Rajasthan 10%, 39% and 7% AWCs respectively had their own building.^{8 9 10}

Out of 24 AWCs, 23 AWCs i.e. 95.8% were pucca houses but cattle shed was seen near 12.5% AWCs and garbage dump or open drains were present near 33.3% centres. Due to garbage dump and open drains, flies and mosquitoes were seen around the centres and this can put the health of the beneficiaries at risk. Unhygienic surroundings of AWCs can also affect the attendance of the beneficiaries. Similar results were seen in studies conducted by Rathore et al in Rajasthan and Gill et al in Punjab where 94% AWCs were pucca houses.¹⁰ In the National Evaluation of ICDS by NIPCCD in 2006, 75% of buildings of AWCs were found to be pucca buildings.¹² Regarding surroundings of the AWCs, Debata et al had findings similar to the present study where the areas surrounding 57% AWCs were hygienic.⁵ In a study by Dhingra et al 20% of AWCs were surrounded with uncovered drains and 11% AWCs

had stagnant water in front of it.¹³

Sign board in local language was displayed in 87.5% of the AWCs. Adequate lighting and proper ventilation was present in 75% AWCs. In a study by Sembiah et al in rural West Bengal there was sign board in 79.2% AWCs and adequate lighting and proper ventilation were present in 60.9% and 65.2% AWCs respectively.⁹ In another study by Malik et al in Delhi adequate lighting and proper ventilation were present in 65.9% AWCs.¹⁴

Regarding adequacy of space, 66.6% of AWCs had adequate indoor space which was as per norms for conducting the pre-school activities. Outdoor space for play was available in 45.8% AWCs and 41.7% AWCs had storage space. Lack of space, both indoor and outdoor, can affect service delivery in the AWCs resulting in decrease in effectiveness of the scheme. A study by Chudasama et al in Gujarat and a national level study conducted by Niti Aayog reported that adequate indoor space was present in 56% and 66% AWCs respectively.^{15 16} However in a rapid assessment study of ICDS in Delhi none of the AWCs in rural area had storage space.¹⁷

Guidelines on general hygiene condition and food handling practices should be followed strictly at the AWCs. Toilet facility was present in 91.7% AWCs and electricity supply was found in 100% AWCs, whereas in studies conducted by Sahoo et al, Rathore et al, and Madhavi et al less than 50% AWCs had toilet facility and electric supply.^{6 10 18} Only 75% AWCs had piped water supply. In rest of the anganwadi, the AW helpers fetched water from outside the AWC for drinking purpose. Even though separate kitchen is mandatory for AWCs, 25% AWCs lacked separate kitchen space and cooking was carried out in one corner of the room. This can lead to illnesses related to indoor air pollution and mishaps. In a study conducted by Chudasama et al only 52% AWCs had water supply.¹⁹ In another study by Siddalingappa et al 88% AWCs had separate kitchens.²⁰

Inadequate space, poor ventilation and lighting, lack of availability of safe water for drinking and cooking purpose along with absence of separate kitchen and storage space can lead to increase in morbidity and mortality due to water borne, food borne diseases and air borne diseases.

It was found that most of the AWCs were well equipped. All the AWCs had chairs, table, mat, PSE material, growth charts, medicine kit and utensils. Salter weighing machine and adult weighing machine in working condition were present in 95.8% and 83.3% AWCs respectively. These findings were supported by Saha et al and Thakur et al where more than 90% AWCs are well equipped.^{21 22} In a study by Gill et al both Salter and adult weighing machine in working condition were present in 41.5% and 31.5% AWCs respectively.¹¹ In another study by Madhavi et al only 53% AWCs had adequate PSE material and supply of adequate medicines.¹⁸

Conclusion and Recommendation

Even though there is improvement in the infrastructure and logistic supplies in the recent years, still it is not satisfactory i.e. 100%. Strengthening of the basic infrastructure of AWCs should be emphasized. An AWC should have its own building with a separate kitchen and other basic amenities like toilet, piped drinking water and adequate space. Proper and adequate infrastructure would further help in delivering quality services to the beneficiaries thus fulfilling the objective of ICDS.

Ethical Clearance: Taken from MKCG Medical College and Hospital Ethical Committee

Source of Funding: Nil

Conflict of Interest: Nil

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Original Research

Anti Pronation Taping and Its Effect on Balance, Explosive Power and Agility of School Going Children with Flat Foot

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Abstract

Background and Objectives: Flat foot is one of the most common conditions observed in adult. The development of foot arch is rapid between 2 and 6 years of age and becomes structurally matured around 12 or 13 years of age. Flat arches in children usually become proper arches and high arches as the child progresses through adolescence and into adulthood. There are many physiotherapy techniques available for the treatment and rehabilitation of pronated foot which includes taping as one of the important interventions for this condition. It is proposed that the application of tape is a means, aims to alleviate pain, improve muscle function, and restore functional movements. The treatment of flat foot aims at to improve the strength, power, agility and balance. Physiotherapy treatments like electrical stimulation, stretching and strengthening exercises. The purpose of the present study is was to find the effects of rigid taping plus conventional therapy and sham taping plus conventional therapy alone in balance, agility and vertical jump height in children with flat foot.

Methods: 44 participants were taken in study, treatment was given daily for 4-week, through lottery random sampling and randomly assigned either of two groups by Opaque envelope method, i.e. Group A rigid taping plus conventional therapy and Group B sham taping plus conventional therapy. In conventional therapy alone i.e. faradic foot bath, stretching and strengthening exercises, Outcome measures were SEBT, VJH and IAT. The measurements were taken very first day prior to the taping and at the end of the 1st, 2nd, 3rd and 4th week of the taping application. Collected data were analyzed using independent t test to compare between groups and repeated measures ANOVA to compare the effects between pre and 1st, 2nd, 3rd and 4th week.

Results: There was no significant difference between both groups ($p > 0.05$). Significant difference was observed in SEBT in all directions and VJH when compared for within weeks in both groups.

Conclusion: There is no difference in effects of rigid taping with conventional therapy and sham taping with conventional therapy in improving SEBT, IAT and VJH for flat foot children.

Keywords: flat foot, rigid taping, SEBT, VJH, IAT.

Introduction

Flat foot is characterized by the flattening of the arch, with the valgus position. Flat foot is one of the most

common conditions observed in adult health practice. [1] A rigid flatfoot has loss of the longitudinal arch height in open and closed kinetic chain, generic classification of flat foot deformities that differentiated between flat feet due to physiological and pathological etiologies. [2] Literature on the incidence and symptomatology of adult flatfoot is limited. Ferciot estimated a 5% incidence of flatfoot in all children and adults. [2, 3]

Younger children often do not complain of pain; however, other subjective symptoms may be present.

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These may include generalized foot, ankle, or leg fatigue, night cramps, clumsiness, excessive shoe wear, athletic abstinence, avoidance of walking distances, and pursuing sedentary activities. [4, 5] The treatment of flat foot aims at to improve the strength, power, agility and balance. Physiotherapy treatments like electrical stimulation, stretching and strengthening exercises. These are important role in the conservative treatment of flat foot.

The objective of taping is to support a weakened part of body without limiting its function, by preventing movements that would stress the weakened area and the primary purpose is to rigid tape around a joint or surrounding tissue. Taping is not a substitute for treatment and rehabilitation, but is an adjunct to the total injury or to trauma care program. There exist several taping techniques established by different author for different purposes. [6]

The effects of ankle taping during specific movements, such as jumps or balance tasks, are scarce, and its influence on sports performance is controversial. [7] Most overuse conditions manifest themselves during weight bearing activities such as standing, walking, jogging or running for a period of time. Therefore, the efficacy of any taping technique can only be assessed if it able to prevent abnormal pronation for this period of time. [8] Hence the present study aims to determine the effects of rigid (Sports) taping and conventional treatment on balance, explosive power and agility of school children with flat foot.

Method

Samples were selected from 4 school out of 11 schools of Bardoli and it was selected by lottery method. There were total 800 children in that school, who were from 8th and 9th standard. Out of 800 children, 166 children volunteered to take part in the study. 166 children were assessed for flat foot by using in "Too many toes" sign, "Calcaneal Angle" and "Navicular Height." 70 children out of 166 were having flat foot. By use of lottery method 44 children were randomly selected. These 44 children were randomly assigned either of two groups by Opaque envelope method. Data collection started after receiving consent form from the children.

166 students from four different schools volunteered to be part of this study. Students from 8th and 9th standard both Boys and Girls were included in this study who were having hyper pronated foot diagnosed by (a) "Too many toes" sign [9], Calcaneal angle (more than 11°) [10], Navicular height (Less than 1 cm). [11] 70 out of 166 were diagnosed to have flat foot out of which 44 students were randomly selected by use of lottery method and were equally and randomly assigned to either of the two groups by using Opaque envelope method - Group A was given rigid taping + Conventional treatment and group B was given Sham taping + conventional treatment.

Students with any previous trauma or fracture at lower limb, History of previous surgeries of the lower limb during last 3 months, Hypersensitive skin and any allergy to tape were excluded from the study.

Outcome measures used were SEBT, Vertical jump height and Illinois Agility test. The study was approved by the Institutional Committee of Ethics of The Sarvajanic College of Physiotherapy.

A common (4 week) intervention program was executed for both groups as conventional therapy which includes- strengthening exercise, stretching & faradic foot bath which are the most frequently used interventions. On every day conventional Physiotherapy was given for 30 minutes.

Strengthening Exercises:

Exercises against resistance: An exercise routine using an exercise band as resistance was instituted. Inversion, eversion, and dorsiflexion exercise were performed. Movements were performed with a controlled eccentric return without rotation the leg. We started with 3 sets of 10 repetitions and gradually increased the number of sets and repetitions until 10 sets of 20 repetitions can be performed. [12]

Double Leg Heel Rises: With the participant standing and holding on to a wall or a chair for balance, their heels were raised off the ground in a controlled manner. The uninjured leg should take 75-85% of the body weight. Participants started at 4 sets of 5 repetitions and progressed to 10 sets of 20 repetitions. [12]

Stretching Exercises:

1. Participants sat to the floor, and legs were straight to touch the floor. Participants lifted one leg feet (normal leg) and touched the last toe finger of the opposite feet (pronated leg). This foot exercise was an effective stretching to build an arch. [13]

2. Participants sat on the floor with knees bend and the both hands in the back for support. Then they separated the foot from the floor whilst keeping the heel on the floor, cramped the toes and were asked to hold it for 15 seconds. [13]

Faradic Foot Bath:

Standard low frequency stimulator, offering surged faradic current with separate controls for surge duration and intervals with surge duration of 10 sec. and interval of 30 sec. was applied. The intensity was enough to produce visible contraction of intrinsic muscle of the foot creating clenching of toes. Participants were asked to curl toes simultaneously along with the current flow and relax during surge interval. This treatment was given for 15 min. [14]

Group A: Anti-pronation taping:

All 22 participants were treated daily for 4 weeks. Rigid tape was applied on one treatment sessions and on the next sessions (next day) it was removed and new tape was applied. The foot region was shaved and the part was dry. Then a non-woven under wrap was applied. The reverse six taping technique was applied. First an anchor was applied one third up the length of the leg with application of a circumferential strip, then the ankle was maximally dorsiflexed when this anchor was applied. The reverse six began at the medial malleolus

and coursed laterally across the dorsum of the foot, under the midfoot in a lateral to medial direction, before crossing its origin to continue up to the anchor strip. Two strips were applied. [15]

Group B: Sham taping:

In sham tapping, rigid tape was applied on hyper pronated foot. Two strips of tape was applied. One strip was over midfoot and another strip was applied in circular manner over both malleolus. This both strips did not follow the principles of any biomechanical correction. This tape was also applied in one treatment sessions and on the next sessions (next day) it was removed and new tape was applied.

Baseline measurements of SEBT, IAT and VJH were taken on first day in both the groups. Measurements were repeated on 7th day, 14th day, 21st day and 28th day and recorded as post taping measurements. These test were explained to the participants and demonstrated if required. Before testing, participants were given three practice trials to become familiar with the testing procedures.

Descriptive statistics including mean, standard deviation were analyzed. Repeated measures ANOVA was used to compare the means of star excursion balance test, vertical jump height and Illinois agility test measures at five time periods – pre, end of 1st week, end of 2nd week, end of 3rd week and end of 4th week in both groups. Independent t-test was used to compare the mean of pre SEBT and post SEBT, pre IAT and post IAT and pre VJH and post VJH outcome measures between the groups. Results were considered to be significant at $p < 0.05$. All statistical analysis was performed using SPSS version 20.

Results

Table 1: Mean Comparison of SEBT values using t test between Rigid Taping group & Sham Taping Group – 1st week

	Rigid Taping	Sham Taping		
	Mean±SD	Mean±SD	t	P
Anterior	65.95±11.38	64.27±11.21	0.494	0.624
Posterior	59.81±13.13	59.36±13.26	0.114	0.910

Cont... Table 1: Mean Comparison of SEBT values using t test between Rigid Taping group & Sham Taping Group – 1st week

Medial	56.40±11.21	56.00±9.78	0.129	0.898
Lateral	60.63±11.83	60.86±12.66	-0.061	0.951
Anterolateral	67.00±12.18	66.18±11.83	0.226	0.822
Anteromedial	63.77±12.42	63.13±11.87	0.174	0.863
Posterolateral	64.59±9.23	63.22±9.49	0.483	0.632
Posteromedial	61.13±12.59	58.90±13.10	0.575	0.569

SEBT: Star Excursion Balance Test

Table 2: Mean Comparison of SEBT values using t test between Rigid Taping group & Sham Taping Group – 2nd week

	Rigid Taping	Sham Taping	t	P
	Mean±SD	Mean±SD		
Anterior	66.04±10.86	64.36±10.58	0.520	0.606
Posterior	58.86±12.13	59.54±12.91	-0.181	0.858
Medial	56.45±11.27	56.27±9.74	0.057	0.955
Lateral	60.68±11.72	60.54±12.80	0.037	0.971
Anterolateral	66.45±11.57	65.72±11.31	0.211	0.834
Anteromedial	63.86±12.13	63.27±11.58	0.165	0.880
Posterolateral	64.95±8.75	63.45±9.11	0.557	0.581
Posteromedial	60.45±11.77	58.50±12.37	0.537	0.594

SEBT: Star Excursion Balance Test

Table 3: Mean Comparison of SEBT values using t test between Rigid Taping group & Sham Taping Group – 3rd week

	Rigid Taping	Sham Taping	t	P
	Mean±SD	Mean±SD		
Anterior	66.45±11.45	64.77±11.13	0.494	0.624
Posterior	60.45±12.92	60.04±13.21	0.104	0.918
Medial	56.72±11.57	56.31±10.09	0.125	0.901
Lateral	60.86±11.74	60.95±12.65	-0.025	0.980
Anterolateral	66.77±11.25	66.22±11.19	0.161	0.873
Anteromedial	64.31±12.60	63.59±11.99	0.196	0.846
Posterolateral	65.18±8.73	63.90±9.02	0.475	0.637
Posteromedial	60.90±12.91	58.63±13.20	0.577	0.567

SEBT: Star Excursion Balance Test

Table 4: Mean Comparison of SEBT values using t test between Rigid Taping group & Sham Taping Group – 4th week

	Rigid Taping	Sham Taping	t	P
	Mean±SD	Mean±SD		
Anterior	66.50±11.04	64.77±10.71	0.526	0.601
Posterior	61.09±13.51	60.59±13.54	0.123	0.903
Medial	56.31±11.18	56.04±9.81	0.086	0.932
Lateral	60.68±11.92	60.63±12.74	0.012	0.990
Anterolateral	67.54±11.86	66.72±11.69	0.230	0.819
Anteromedial	63.90±12.20	63.45±11.67	0.126	0.900
Posterolateral	65.27±8.97	64.00±9.35	0.461	0.648
Posteromedial	61.31±12.37	59.09±12.81	0.586	0.561

SEBT: Star Excursion Balance Test

Table 5: Mean Comparison of IAT values using t test between Rigid Taping group & Sham Taping Group on pretest, 1st week, 2nd week, 3rd week and 4th week

	Rigid Taping	Sham Taping	t	P
	Mean±SD	Mean±SD		
Pre	19.81±1.29	20.13±1.24	-0.830	0.411
1st week	19.95±1.43	20.09±1.23	-0.339	0.736
2nd week	19.90±1.30	20.18±1.18	-0.727	0.472
3rd week	20.00±1.51	20.18±1.33	-0.423	0.674
4th week	20.00±1.27	20.31±1.32	-0.813	0.421

IAT: Illinois agility Test

Table 6: Mean Comparison of VJH values using t test between Rigid Taping group & Sham Taping Group on pretest, 1st week, 2nd week, 3rd week and 4th week

	Rigid Taping	Sham Taping	t	P
	Mean±SD	Mean±SD		
Pre	30.22±1.34	29.50±3.27	0.963	0.341
1st week	30.59±2.15	29.59±4.15	1.001	0.322
2nd week	30.95±1.78	29.81±3.36	1.400	0.169
3rd week	31.04±1.88	29.72±3.56	1.534	0.133
4th week	31.09±2.04	30.72±3.62	0.410	0.684

VJH: vertical jump height

Discussion

The present study focused on the effects of 4 weeks of application of rigid taping plus conventional therapy and sham taping plus conventional therapy on balance which was assessed using star excursion balance test, agility which was assessed Illinois agility test, and vertical jump height which was assessed using vertical jump test. It also compared the effects of rigid taping plus conventional therapy and sham taping plus conventional therapy in hyper pronated foot in children on the above mentioned outcome measures.

Results of this study showed no significant difference while comparing the mean of SEBT, IAT and VJH values between rigid taping group & sham taping group on 1st week, 2nd week, 3rd week and 4th week (**Table 1 to Table 6**)

Limitations

1. Age of children were limited from 8th and 9th standard only
2. Dominance of leg was not taken into consideration.
3. Inclusion of non-athletic children with flat foot.

Conclusion

Rigid taping with conventional therapy and sham taping with conventional therapy both does not have any clinically significant effect in improving SEBT, IAT and VJH, although SEBT and VJH were statistically significance of within the rigid taping plus conventional therapy group and sham taping plus conventional therapy group.

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Gingival Prostheses: An Esthetic Solution to Periodontally Compromised Patients- A Case Report

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Abstract

Gingival recession often compromises the esthetics of the patient especially when it occurs in the anterior region . Often the patient exhibits open embrasures, increased crown height, and black triangles. The reduced bone height often compromises the possibility for a predictable outcome after various root coverage procedures. Hence these procedures may not give a satisfactory esthetic results . In addition to that surgical root coverage might cause discomfort to the patient and requires considerable healing time. Gingival veneer masks are simple alternative approach in these patients with unsightly gums associated with severe gingival recession especially when they are well motivated for good oral hygiene measures. This article aims to describe a clinical case of a young patient with advanced gingival recession. The gingival prostheses is a boon to patients who are esthetically compromised due to severe gingival recession.

Keywords: Anterior, Black triangle, Esthetic, Recession, Veneer

Introduction

Gingival recession is the exposure of root surface resulting from migration of the gingival margin apical to the cement enamel junction (CEJ). The etiology of the condition is multifactorial and may include plaque-induced inflammation , calculus , restorative and iatrogenic factors, trauma from occlusion, improper oral hygiene practices, tooth malpositions, high frenum attachment, improper periodontal treatment procedures and uncontrolled orthodontic movements.^{1,2}

Several reports have presented the short term and long term effects of various forms of periodontal therapy. It was also found that recession took place following periodontal treatment program that involved both surgical and nonsurgical measures, which led to various aesthetic and sensitivity problems.³

Bone loss in alveolar crest which is inevitable in periodontal disease ,leads to loss of interdental papilla which further leads to formation of black triangles. According to Tarnow et al the distance between the contact point and alveolar crest should be atleast 5mm for formation of interdental papilla.⁴

Anterior esthetics hence becomes crucial in patients with periodontal disease with open embrasures, increased crown height and black triangles. Dental esthetics is affected not only by dental component but also by muco-gingival component. Even a well fabricated anterior restoration is considered a failure if there is a presence of black triangle or inadequate marginal and attached gingiva, especially in patients with high smile line. Management of recession varies according to classification of gingival recession. Class I and II can be managed surgically whereas severe and extensive recession in multiple teeth can be managed nonsurgically with gingival prostheses. Gingival prostheses is also called as flange prosthesis, gingival mask, gingival veneer prosthesis, gingival replacement unit and artificial gingiva⁵.

Gingival Prostheses may be fixed or removable and fabricated using silicones, acrylics, composite resins or ceramics according to what is best suited for the case. Materials used for gingival prosthesis include pink autocure and heat cured acrylics, porcelains, composite resins, and thermoplastic acrylics as well as silicone based soft materials.^{6,7}

The indications of gingival prosthesis are.⁸

1. Gingival recession with root exposure and open interdental spaces due to loss of papilla after periodontal disease or post periodontal treatment.
2. Provisional coverage prior to definitive restorations.
3. As gingival augmentation for implant supported prosthesis.
4. When there is proclination of teeth along with mild recession.
5. As an interim measure in cases where final treatment planning is delayed.

Contraindications of gingival prosthesis include ⁸

1. Poor or unstable periodontal health
2. Poor oral hygiene.
3. High carious activity.
4. Known allergy to silicone or acrylic.
5. Heavy smoker

This article presents the management of a case of severe class III gingival recession in both maxillary and mandibular anterior teeth.

Case Description

A 35 year old female patient reported with a chief complaint of receded gums and unesthetic appearance in the upper and lower front teeth.

The patient had undergone periodontal flap surgery 10 years back. She has been regularly attending the follow up maintenance visits for the past 10 years and now the periodontium is stable.

On clinical examination, Millers class III gingival recession was revealed with proclination of both maxillary and mandibular teeth. It was also observed that there were black triangles and increased spacing between teeth. Patient had a good oral hygiene. Gingival examination showed absence of any bleeding on probing

or colour changes. The gingival consistency was firm and resilient. Gingival margin position was 4-5 mm apical to cement enamel junction in most of the maxillary and mandibular teeth.



Fig 1 Gingival recession in maxillary teeth



Fig 2 Gingival recession in mandibular teeth

Periodontal examination revealed absence of any pockets. There was no mobility recorded in any of the teeth. Pathological migration was recorded especially in the anteriors with increased proclination and spacing between the teeth.

Since the radiographs revealed moderate amount of bone loss, root coverage procedures were not the choice of treatment for this patient. Hence it was decided to fabricate a gingival prostheses since the patients main concern was esthetics.

Upper and lower impressions were made with alginate. The cast was prepared using die stone and wax up was done.



Fig 3 Upper wax up



Fig 4 Lower wax up

The veneers were fabricated with heat cure acrylic using lost wax technique. Gingival veneers were then finished and polished.



Fig 5, Fig 6 Upper and lower gingival prostheses placed.



Fig 6

The final corrections were made in the veneers after properly seating it on the patients oral cavity, by carefully checking if the prostheses is encroaching the frenum or causing any pain or discomfort. It was made sure that the prostheses was not causing any discomfort.

The placement of veneer esthetically enhanced the patients appearance and confidence.

Patient was instructed to place the prostheses in water when not in use to avoid ploymerisation shrinkage. All the plaque control and oral hygiene measures were reinforced. Patient was also instructed the proper mechanical brushing of the prosthesis. Patient was recalled for review after a week to check for ulcerations, discomfort or pain. Patient didn't report any pain or ulcerations. She was also instructed to regularly report for the followup visits for maintenance.

Discussion

The management of gingival recession is still a challenge to present clinicians. Various nonsurgical and surgical procedures have been tried and tested. The predictable outcome of these procedures depend on the type of gingival recession, amount of hard and soft tissue loss, etiology of recession , anatomical factors and habits. Root coverage procedures like free gingival grafts, connective tissue grafts, pedicle flaps have given positive outcomes but only in Millers Class I and Class II recession types. Class III and Class IV recession defects with significant bone loss are not ideal indications for these types of surgical procedures.

Hence although many surgical procedures have been proposed for augmentation of bone and soft tissue structures, predictable results may not be routinely achievable.⁸

Various other therapeutic strategies include tooth coloured composite restoration, pink porcelain and orthodontic treatment.⁹

Difficulties associated with pink porcelain or composite would be getting a good colour match of restorative material for the gingival tissues, moisture control from gingival crevicular fluid, technique sensitivity and cost.¹⁰

Among the various materials acrylic resin is widely used, relatively cheap and allows a better colour match. It allows better polishing ensuring remarkable esthetic results. Acrylic veneers are easy to maintain and are removable. Hence it was chosen as the material for gingival prostheses in the present case report. Such prostheses are indicated only in patients with good oral hygiene maintenance as it can lead to food plaque acculation and bacterial growth.

Presently newer materials like silicone have been considered as they are known to provide better flexibility and adaptation, patient comfort and increased resistance to fracture.¹¹

Conclusion

Gingival prostheses may always be considered as an effective alternative approach to manage severely receded gingiva by providing a noninvasive technique with improved esthetics, ease of fabrication and possibility for better maintenance. A clear understanding of shade and form is essential to fabricate such a prosthesis. Although such prosthesis is considered auxiliary, it mimics the natural appearance of the gingiva in a predictable way. It also provides the patient with greater sense of psychological satisfaction as far as esthetics are concerned.

Clinical Significance

Esthetics is the main concern in most of the periodontally compromised patients. A proper periodontal treatment stops the progression of periodontal bone and tissue loss but does not completely restore the

lost tissues. Hence the patient is not satisfied as far as esthetics are concerned. Gingival prostheses solve this problem especially in compliant patients with good oral hygiene. Hence it's a boon which satisfies such patients by enhancing their esthetics as well as confidence.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Approval: Taken from institutional ethics committee.

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Oral Hygiene Practices, Smoking Habits and Self-Perceived Oral Malodor among Dental Students

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Abstract

Objective: 1. To assess the oral hygiene practices of dental students. 2. To assess the smoking habits among dental students. 3. To assess the self-perception of bad breath. 4. To determine the differences of self perception of halitosis and oral hygiene practices among male and female students.

Materials and Method: This descriptive study contains a questionnaire to assess the self perception of bad breath, tooth decay, dryness of mouth, bleeding gums, prevalence of smoking habits, oral hygiene practices among the dental students of Saveetha Dental College, Chennai. 386 students were randomly involved in the study to achieve the sample size. The data was collected and statistically evaluated using SPSS software.

Results and Conclusion: The response rate was 92.5%. Smoking was prevalent among 8% of male students, out of which 83% have been smoking for the past 5 years. Almost 94% had a desire to quit tobacco. 68.7% brushed twice daily while 4.7% students brushed more than two times. 93.3% dental students are found to be using other oral hygiene aids. 42.7% students used mouthwash whereas 23.3% use tongue cleaner. Dental caries was prevalent among 25.6% of students, bleeding gums among 7.5% and dryness of mouth among 6.7%. 27% students could perceive oral breath, whereas only 5% students experienced interference at their work. Morning breath was common among 64.5% of students, both male and female. The correlation between tobacco usage and its effect on oral cavity was assessed. 17.2% of students who use tobacco have reported bleeding gums and 20.7% smokers reported dryness of mouth.

Keywords: oral malodor, smoking habits, oral hygiene practices, halitosis

Introduction

Oral diseases are related to the behavior of an individual, and its prevalence has been found to decrease with improvements in oral hygiene.^[1] Oral health knowledge is considered to be an essential prerequisite for health-related behavior.^[2] Oral health is as such an integral part of general health.^[3]

Halitosis is a term used to describe any unpleasant or disagreeable odor in the expired air. Many researches

and reviews have put forth that persistent halitosis is more commonly associated with several intrinsic factors of oral cavity such as tooth decay, periodontal diseases, poor oral hygiene, oral mucosal diseases and disorders of other systems of the body such as gastrointestinal disorder, respiratory disorder, renal disorder and also certain medications.^{[4][5][6][7]}

In healthy individuals, the most frequent sources of halitosis include bacterial reservoirs such as dorsum of the tongue, saliva and periodontal pockets.^{[8][9]} Oral malodor is not considered a disease per se but rather a social stigma that can cause personal discomfort and embarrassment among other people.^{[6][9]}

Tobacco use is a major risk factor for many health related problems.^[10] The World Health Organisation

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(WHO) estimates that over one billion individuals are smoking tobacco currently, and approximately five million deaths are attributed to tobacco in a year.^[11] Tobacco use has many oral adverse effects.^[10] Despite the knowledge that tobacco use contributes to serious health problems, the prevalence of tobacco use continues to be increasing.^[12] Physicians are generally considered as role models for their patients.^[13] They also play a major role in encouraging the patients to quit tobacco use.^[14] Oral health care providers are considered more responsible to enhance oral health.^[3] They can do so only if they have a sound oral health themselves.

The purpose of this study was to estimate the prevalence of oral hygiene practices, oral malodor and smoking habits among the dental students. This study also aims in determining if there is any difference between self perception of halitosis and oral hygiene practices among the male and female dental students.

Materials and Method

This descriptive study was carried out on 386 male and female dental students from Saveetha dental college and hospitals, Chennai. A self-administered questionnaire was distributed among 58 male and 328 female students to assess the self-perception of oral health, awareness of bad breath, treatment received for bad breath, prevalence of oral hygiene practices, dental caries, bleeding gums, dryness of mouth and smoking habits. A prevalidated and pretested^[9] questionnaire was developed.

The questionnaire was distributed to the above mentioned dental students. The identity of the students was not disclosed and the confidentiality of the identity was assured to them. Prior to the start of the study, Ethical approval was obtained from the Scientific Review Board of Saveetha University. A written informed consent was obtained from every participant and their personal identity were masked during data processing and analysis. Sufficient amount of 15 minutes was provided for filling up the questionnaire. Following this, data was statistically analyzed using Statistical Package for Social Sciences (SPSS) for windows software. Descriptive statistics using percentage and N and inferential statistics done using chi square test. A p value of <0.05 was to be considered significant.

Results

A total of 386 dental students from year 1 to 4, dental interns and post graduates responded to the questionnaire, (figure 1) of which 58 were male and 328 were female. The sample consisted of male and female students from first year (78 students), second year (77 students), third year (73 students), fourth year (91 students), dental interns (39 students) and PG's (28 students). The sample size was calculated based on the study conducted by Setia et al. Approval from SRB prior to the study was granted by the college. Pre-tested and prevalidated questionnaire referred from the study conducted by Setia et al was used. The incomplete questionnaires were not included in the study and only those duly filled were considered valid and included in the study. All the respondents were in the age group of 17-31 with a mean age of 20.47 years.

Only 8% (31 out of 386) of the total respondents reported with the habit of smoking of which all of them were males (31 out of 58) and no one was found to use smokeless tobacco. Most of these cigarette smokers have been smoking for the past 5 years (83%) and 16% for the past 5 to 10 years. 30 out of 31 cigarette smokers smoke less than 5 cigarettes per day. 96.7% students reported that they initiated smoking during college whereas 3.2% initiated smoking during their schooling. Most smokers indicated that they smoke because of pressure (N=11, 35.4%), as a reward (N=8, 25.8%), leisure/boredom/loneliness (N=8, 25.8%) and as experimentation (N=4, 12.9%). Almost everyone (N=30, 96.7%) expressed a desire to quit tobacco in the future.

The results revealed that all participants brush their teeth daily. 26.7% of individuals brushed only once a day, 68.7% brushed twice a day and only 4.7% brushed more than twice a day. 42.7% changed their brush once in 3 months, 48% changed once in 3 to 6 months and 8.5% changed after 6 months. 81% students reported with rinsing habit after every meal. Only 8.8% students used dental floss whereas 1.6% used interdental brushes. 42.7% dental students used mouthwash as additional oral hygiene aids and 23% used tongue cleaners. Self-assessed oral malodor, dryness of mouth, dental caries and bleeding gums were assessed among the dental students. (Table 1) 26.9% dental students reported with self-reported halitosis of which, early morning bad

breath was reported by 64.5% . (figure 2)

The correlation of tooth decay and bad breath with tobacco usage was assessed and there was no statistically significant difference between the two groups whereas the correlation between bleeding gums and dryness of mouth with tobacco usage was assessed and was found to be statistically significant.(Table 2) It was found that, out of 104 students who reported with bad breath, 55% were those students who brush twice a day and 35% students who brush only once a day. This result showed statistical significance.(Table 3)

FIGURE1: distribution among UG/PG students

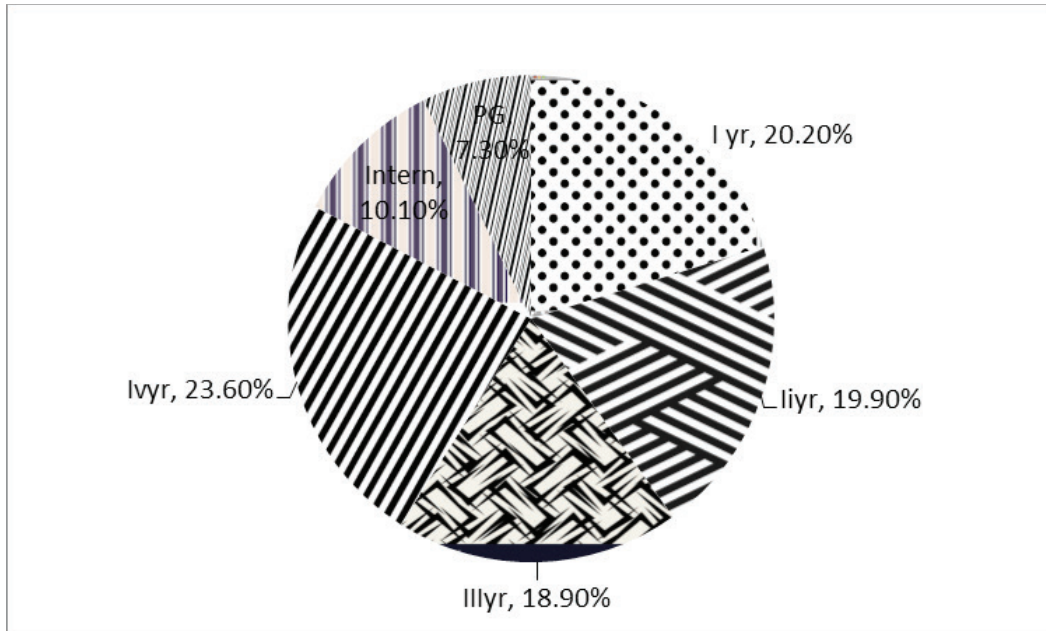


Figure 2: time of bad breath

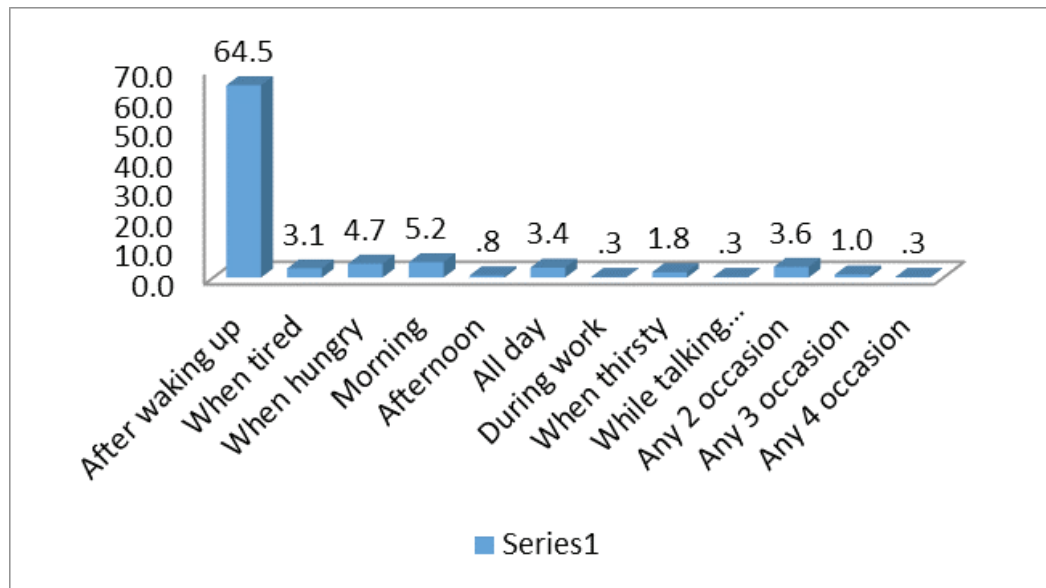


Table 1: prevalence of oral hygiene practices among dental students

			Total			
	MALE		FEMALE		n	%
Brushing using toothpaste and toothbrush	58	15%	328	84.9%	386	100%
brushing once daily	18	4.6%	85	20%	103	26.70%
Students brushing twice daily	38	9.8%	227	58.8%	265	68.70%
Students brushing more than twice daily	2	0.5%	16	4.14%	18	4.70%
Students changing their brush within 3 months	28	7.2%	137	35.4%	165	42.70%
Students changing their brush within 3-6 months	29	7.5%	159	41.1%	188	48.70%
Students changing their brush after 6 months	1	0.25%	32	8.2%	33	8.50%
Students having rinsing habit after meal	46	11.9%	268	69.4%	314	81.30%
Students using dental floss	5	1.2%	29	7.5%	34	8.8%
Students using mouthwash	16	4.14%	149	38.6%	165	42.70%
Students using interdental brushes	0	0%	6	1.5%	6	1.60%
Students using tongue cleaner	15	6.47%	75	19.4%	90	23.30%
Students using any two oral hygiene aids	16	4.14%	38	9.8%	54	14%
Students using any three oral hygiene aids	1	0.25%	8	2%	9	2.30%
Students having tooth decay	20	5.18%	79	20.4%	99	25.60%
Students having bleeding gums	9	2.3%	20	5.1%	29	7.50%
Students having dry mouth	9	2.3%	17	4.4%	26	6.70%
Students who smoke	29	7.5%	0	0%	58	15.00%

Table2: Correlation between tobacco usage and bleeding gums

	TOBACCO USAGE				TOTAL	
	YES		NO		n	%
	n	%	n	%		
BLEEDING GUMS	5	17.2%	24	82.8%	29	100%
DRYNESS OF MOUTH	6	20.7%	23	79.3%	29	100%

Table3: Correlation of brushing techniques and oral malodor

BRUSHING FREQUENCY	ORAL MALODOR				TOTAL	
	YES		NO		N	%
	n	%	n	%		
ONCE A DAY	36	34.6%	67	23.8%	103	26.7%
TWICE A DAY	58	55.8%	207	73.4%	265	68.7%
MORE THAN TWO TIMES A DAY	10	9.6%	8	2.8%	18	4.7%

Discussion

The sample size calculated based on the study conducted by Setia et al was 417. Only questionnaire which were duly filled with all details and those which was returned back were considered valid. The response rate was found to be 92.5% (N=386) The rationale behind this study was to assess the oral hygiene practices, smoking habits and self perception of bad breath among the dental students.

In 2003, Almas el at conducted a study to determine the prevalence of oral hygiene practices and halitosis among undergraduate students from King Saud University, College of Dentistry. The results revealed that female students had better oral hygiene practices , significantly less self-reported oral bad breath and smoked less compared to male students.⁹

In as similar study conducted by Setia et al in 2014, the prevalence of oral hygiene practices, smoking habits and halitosis among undergraduate dental students and correlation between oral hygiene practices, oral health conditions to the prevalence of self perceived oral malodor was determined. They proved a direct correlation between oral hygiene practices and oral health conditions with halitosis. Females exhibited better oral hygiene practices and less prevalence of halitosis as compared to male students.³

Though the response rate is high we were not able to cover all the students into this study. The sample was based on convenience. This was found to be a limitation

of this study. Being a questionnaire study, there are high chances of socially desirable answers being given by the participants. The expected outcome of tobacco usage was found to be very less and this could be one of the reasons.

Conclusion

Within the limitations of this study, the following conclusions can be drawn regarding oral malodor:

- Smoking was prevalent among 8% of male students, out of which 83% have been smoking for the past 5 years. Almost 94% had a desire to quit tobacco.
- Most of the students (68.7%) brushed twice daily while 4.7% students brushed more than two times.
- 93.3% dental students are found to be using other oral hygiene aids. 42.7% students used mouthwash whereas 23.3% use tongue cleaner.
- 27% students could perceive oral breath, whereas only 5% students experienced interference at their work.
- Morning breath was common among 64.5% of students, both male and female.
- 17.2% of students who use tobacco have reported bleeding gums and 20.7% smokers reported dryness of mouth.
- 34.6% of students who brushed once daily reported with oral malodor whereas it was reported by 55.8% of students who brushed twice daily.

Ethical Clearance- Taken from Ethical committee of Saveetha University.

Source of Funding- Self

Conflict of Interest- Nil

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Clinico-social Profile of Animal Bite Cases Attending Tertiary Care Teaching Hospital in Maharashtra, India

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Abstract

Introduction: Rabies is primarily a communicable zoonotic disease of warm blooded animals particularly carnivores, such as dogs, cats, jackals & wolves. It is an acute highly viral disease which affects the central nervous system. It is the only communicable disease of man that is always fatal.

Objective: To study the clinico-social profile of animal bite cases attending tertiary care teaching hospital in Maharashtra.

Method: A hospital based observational descriptive study was conducted amongst 6050 patients of animal bite coming to the ARV OPD from 1st January 2014 to 31st December 2014 in tertiary care teaching hospital in Maharashtra.

Results: In the present study, majority cases 3467(57.3%) were males, 2843 (47%) were in the age group of 21 to 40 years. There were 4647(76.8%) unprovoked, 4127(68.2%) category III and 4780(79%) by non-observable animals bites. Most common site 4962(82%) was extremities. Maximum 2602(43%) cases reported to ARV OPD within 24 hours of animal bite. Only 320(5.3%) cases have taken proper wound care (washing with water and soap) as compared to 3206 (53%) cases who had taken no home management for wound care. Active immunization (anti-rabies vaccine) was administered to 6001(99.2%) of cases and passive immunization with anti-rabies serum (ARS) was advised in all 4126(68.2%) of category III patients.

Conclusion: Study concludes that patients should be made aware of immediate reporting of animal bites, importance of proper care of wound and necessity of taking ARV and ARS. Information, Education and Communication activities should be facilitated to promote public awareness about the prevention and treatment of animal bite cases.

Key words: Animal bite, clinic-social profile, tertiary care teaching hospital.

Introduction

Rabies has terrified man since antiquity and continuous to be a major public health problem in India. It is an ancient disease as old as human beings. It is primarily a communicable zoonotic disease of warm

blooded animals particularly carnivores, such as dogs, cats, jackals & wolves. It is also known as Hydrophobia. It is an acute highly viral disease which affects the central nervous system. It is the only communicable disease of man that is always fatal. The first description of the disease dates from the 23rd century BC. Virus was isolated in 1885 by Dr. Louis Pasteur; he then developed the first rabies vaccine. Rabies is a global problem. Human deaths are about 60,000 per year worldwide. Globally each year 10 million people require post exposure treatment. Some countries have achieved "Rabies Free" status by vigorous campaign

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of elimination, while in others disease has never been introduced. Water appears to be the most effective natural barrier to rabies.^[1] Canine rabies continues to exist in 87 countries or territories of the world and these accounts for 99 % of all human rabies cases.^[2]

Approximately 35,000 to 40,000 human deaths occur due to rabies each year in the countries of South East Asian region (SEAR). Maldives is the only country in the region which does not have human (or) animal rabies. Two countries Bangladesh, India belongs to high incidence category. It occurs in all parts of India, except Lakshadweep, Andaman & Nicobar Islands. Every year approximately 1.1 to 1.5 million people receive post exposure treatment. More than 95% cases are due to dog bites. Dog population in India is around 25 million & most of them are not protected against rabies.^[3] Hence this study was carried out to study the clinico-social profile of animal bite cases attending tertiary care teaching hospital in Maharashtra.

Material & Method

Study design: This study was a hospital based observational descriptive study.

Study area: The study was undertaken in anti-rabies vaccination (ARV) outpatient (OPD) department of tertiary care teaching hospital in Maharashtra.

Study period: The study period was one year i.e. from 01st January 2014 to 31st December 2014.

Study Sample: In this study, all 6050 patients of animal bite (who fulfils the exclusion criteria) coming to the ARV OPD during study period were enrolled for the study.

Data collection: After explaining the purpose of study and obtaining verbal informed consent from the patients, they were interviewed with the help of preformed structured questionnaire and clinical examination was done during OPD hours from 9-12 noon and during Sunday and other government holidays between 9-10 am in ARV OPD. Data was collected in ARV OPD up to the end of study period. The study was approved by the Institutional Ethics Committee. All the patients were subjected to clinico-social profile and detailed history about type of bites including site, duration, category of exposure, wound toilet, treatment including both active

and passive immunization was taken. History regarding home management of wound before coming to ARV OPD was elicited from animal bite patients like application of oils, salt, alum, lime, chilli powder, turmeric powder, antiseptic solution and washing wound with water and soap was inquired. Throughout the study anonymity of all patients was maintained and privacy as well as confidentiality of the data was assured. Categoriation of exposure was done as per the guidelines given by World Health Organization (WHO).^[4] A bite was considered as provoked, if it resulted from patient initiating interaction with the animal such as playing with them or annoying them during their meal.

Exclusion Criteria: Patients who came for pre-exposure prophylaxis, medico-legal cases and human bite cases were not included in the study.

Data Analysis: Records of all patients were studied and data regarding their clinico-social profile was analyzed. Data was entered in Microsoft excel sheet and it was analyzed with Epi info software. Statistical analysis was done by using simple proportions and percentages whenever necessary.

Results

Table 1: Age and gender wise distribution of study population

Age (in years)	Male	Female	Total	Percentage
≤ 10	525	382	907	15.0
11-20	403	323	726	12.0
21-30	1120	816	1936	32.0
31-40	497	410	907	15.0
41-50	434	354	788	13.0
51-60	348	136	484	08.0
≥ 61	140	162	302	05.0
Total	3467	2583	6050	100

It was observed from **Table 1** that out of 6050 cases of animal bites reported at ARV OPD during the study

period, more than half 3467(57.3%) were males and 2583(42.7%) were females. Majority 1936(32%) cases were in the age group of 21-30 years, followed by 1695(28%) were in the age group of 31-50 years, 1633(27%) were in the age group of 0-20 years and 786(13%) cases were the above 50 years.

Table 2: Clinoco-social profile of the study population

Clinoco-social profile	Number (n=6050)	Percentage
Category of exposure		
Cat- I	48	0.8
Cat- II	1875	31.0
Cat- III	4127	68.2
Site of bite		
Extremities	4962	82.0
Trunk	423	07.0
Head, Neck, Face	665	11.0
Provocation		
Provoked	1403	23.2
Unprovoked	4647	76.8
Animal observe		
Observable	1270	21.0
Non-observable	4780	79.0
Time of reporting to ARV OPD		
<24 hrs	2602	43.0
1-3 days	2359	39.0
4-10 days	847	14.0
>10 days	242	04.0

It was seen from **Table 2** that majority 4127(68.2%) cases were of category III, while 1875(31%) cases of category II and 48(0.8%) cases of category I. Most common site of animal bite was the Extremities which accounted for 4962(82%) of cases. Unprovoked bites were seen in 4647(76.8%) cases, whereas provoked bites were seen in 1403(23.2%) cases. Majority 4780(79%) cases belonged to non-observable, while 1270(21%)

belonged to observable animal bites. Majority 2602(43%) cases reported to ARV OPD within 24 hours followed by 2359(39%) cases reported in 1-3 days, 847(14%) cases reported in 4-10 days and 242(04%) cases reported after 10 days of animal bite.

Table 3: Distribution of cases according to the home management of wound before coming to ARV OPD

Home management of wound	Number	Percentage
No home management	3206	53.0
Lime	2305	38.1
Washed with water	810	13.4
Washed with water and soap	320	5.3
Turmeric powder	726	12.0
Antiseptic	187	3.1
Chilli powder	943	15.6
Other (salt, oil, alum)	2178	36.0

It was observed from **Table 3** that 3206(53%) of patients did no management before coming to ARV OPD. In home management, majority 2305(38.1%) patients have applied lime, followed by 2178(36%) used other things like salt, oil, alum etc. While 943(15.6%) patients used chilli powder and 320(5.3%) patients used water and soap for cleaning the wound and a very few 187(3.1%) used antiseptics.

Table 4: Distribution of cases according to hospital management of animal bite

Hospital management	Number	Percentage
Wound toilet after bite	4961	82
Injection tetanus toxoid (TT)	6001	99.2
Anti-rabies vaccination (ARV)	6001	99.2
Anti-rabies serum (ARS)	4126	68.2

Distribution of cases according to hospital management of animal bite is shown in **Table 4**. Wound toileting in ARV OPD was done in 4961(82%) cases while active immunization (anti rabies vaccine) and injection tetanus toxoid (TT) was administered to 6001(99.2%) of cases and passive immunization with anti-rabies serum (ARS) was advised in all 4126(68.2%) of category III patients.

Discussion

Animal bites mainly dog bites lead to a highly fatal still preventable disease called Rabies. In the present study, majority of the cases 3467(57.3%) were males as seen in study of Shah L et al[4] and explanation of which lies in the fact that men are more exposed to outdoor chores as compared to women. Study done by Sudarshan et al^[5] also showed males were more affected (68%) than female (31.7%). In a study by Ichhpujani RL et al^[6], it was seen that children are the most frequent victim of

dog bite, contrary to this we found that majority of the cases 2843(47%) were in the age group of 21 to 40 years. Unprovoked 4647(76.8%), category III 4127(68.2%) bites by non-observable animals 4780(79%) accounted for most of the cases. Most common site involved in these cases was found to be extremities 4962(82%), which is in accordance with findings of other studies.^[7-8] In our study, majority 2602(43%) of the cases reported to ARV OPD within 24 hours of the animal bite followed by 2359 (39%) cases reporting in 1-3 days, 847 (14%) cases reporting in 4-10 days and 242 (04%) cases reporting after 10 days of animal bite. Similarly study done by Sridhar PV et al^[9] also gave similar findings i.e. (43.6%) patients reported on the same day of bite and 576 (33.4%) reported on the next day.

In the present study, large number of cases 3206(53%) had taken no home management for wound care, similar findings were observed in various studies^[10-13], while only 320(5.3%) cases have taken proper wound care (i.e. washing with water and soap). Similar type of observation was found in study done by Borkar A et al.^[14] In home management, majority 2305(38.1%) patients have applied lime, followed by 2178(36%) used other things like salt, oil, alum etc on bite site, while 943(15.6%) patients used indigenous product like chilli powder. A common perception is that local irritability produced by these substances would destroy the rabies virus in the wound. In the present study, active immunization (anti rabies vaccine) and injection tetanus toxoid (TT) was administered to 6001(99.2%) of cases and passive immunization with anti-rabies serum (ARS) was advised in all 4126(68.2%) of category III patients. Similar type of finding was observed in a study done by Borkar A et al.^[14]

Conclusion

This study highlights the importance of clinico-social factors looking into the in-depth analysis of animal bite cases. The facilities made available at the ARV OPD of the tertiary care hospital for the management and care of animal bite cases shall go a long way in gaining long lasting impact on curbing the menace of animal bite & associated illnesses among people. Our study findings suggests that the majority of the patients should be made aware of immediate reporting of animal bites, importance of proper care of wound and necessity

of taking ARV and ARS. Information, Education and Communication (IEC) activities should be facilitated to promote public awareness about the prevention and treatment of animal bite cases.

Ethical approval: The study was approved by the Institutional Ethics Committee

Source of Funding- Nil

Conflict of Interest – None declared

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Evaluation of Tanaka and Johnston and Moyers Mixed Dentition Space Analysis in a Population of Mysore, India

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Abstract

Objectives: To evaluate applicability of Tanaka and Johnston (T&J) and Moyer's mixed dentition prediction methods and formulate regression equations for predicting mesiodistal widths of unerupted canines and premolars in Mysore population. Dental casts of 400 Mysore subjects aged 16-23 years were used. Mesiodistal dimensions of mandibular permanent incisors, maxillary and mandibular permanent canines, first and second premolars were measured using a digital calliper calibrated to 0.01mm. Actual teeth measurements were then statistically compared with predicted values derived from T&J's equations and Moyers probability tables at 75th percentile. T&J prediction equations overestimated mesiodistal widths of permanent canines and premolars in both arches. Moyers 75th percentile also overestimated actual measurements except for maxillary arch in female subjects. Percentage of overestimation was more for T&J prediction method than Moyers. Regression equations and probability tables derived for tooth size prediction for Mysore population would be more accurate when applied locally.

Key words: Mixed dentition analysis, Moyer's analysis, Regression equations, Tanaka and Johnston analysis.

Introduction

Malocclusion which is in dormant condition in deciduous or mixed dentition period usually, surfaces after eruption of permanent successors. Arch length and tooth size discrepancy¹ is a common problem in mixed dentition phase. Predicting size of unerupted canines and premolars in mixed dentition phase is a challenge during orthodontic diagnosis.

Concept of dental space analysis is recent and attempts have been made to predict width of unerupted permanent canines and premolars in early 1900's. Typically, mesiodistal dimensions of unerupted canines and premolars have been extrapolated from measurements of erupted permanent mandibular incisors using T&J prediction equations² or Moyers probability tables³. Both prediction techniques were developed using population of "probable" North European ancestry. Evidence of racial tooth size variability suggests that prediction techniques based on a single racial sample are not universal.

Hence, it is of utmost importance that prediction techniques are interpreted relative to respective racial norms, since failure to consider tooth-size, racial variations would render interpretation of T&J prediction equations² and Moyers probability tables³ as misleading and erroneous.

To date, no data have been published regarding either study of mixed dentition analysis or study of mesiodistal tooth sizes in Mysore population, India. Hence, this study aims to evaluate reliability of T&J equations^{4,2} and Moyers charts⁵ among Mysore population.

Objectives

1. To evaluate applicability of T&J prediction equations and Moyers probability charts (75th percentile) among Mysore population
2. To formulate regression equations for predicting mesiodistal widths of unerupted canines and premolars among Mysore population.
3. To construct probability tables for predicting mesiodistal widths of unerupted canines and premolars

to be used among Mysore population.

Materials & Method

It's a cross sectional study conducted over a period of four months using study models. Dental study models of 400 subjects (200 males & 200 females) were collected from patients visiting JSS Dental College and Hospital Mysore.

Criteria for selection of subjects were: Participants

- v Aged 16 -23 years.
- v Must have all permanent mandibular incisors, canines & premolars & permanent maxillary canines & premolars fully erupted.
- v Teeth measured should be free of restorations, fractures or proximal caries.
- v Should not have hypoplasia or anomalies of teeth
- v Pre orthodontic models with Angles class I molar relation with minor rotations, crowding or spacing was acceptable.

Orthodontic study models were made by using alginate impression and poured in dental stone immediately. All measurements were taken directly from unsoaped plaster study models. Teeth measured included mandibular permanent central and lateral incisors, maxillary and mandibular permanent canines, first and second premolars. Mesio distal measurement was done using digital calliper (figure 1) and values obtained for right and left segments were averaged so that we obtained single mesio distal width for maxillary and mandibular permanent canines, first and second premolars.

Statistical Analysis

Comparison of mean scores between different genders was done using independent sample t-test and scores between Mysore population and estimates of T&J prediction and Moyer's prediction charts was done using paired t-test. Correlations between these scores were determined using Pearson's correlation co-efficient while a simple linear regression was used to predict values of Mysore population.

Result: Descriptive statistics in relation to gender is presented in table 1. Table 2 shows significant gender difference in sum of mesiodistal widths of mandibular incisors ($p = 0.02$) and sum of permanent canines and premolars in mandibular arch ($p = 0.007$). In maxillary arch, T&J method overestimated values for both males and females ($p = 0.001$). In mandibular arch, significant differences were observed between predicted T&J equations and actual values ($p = 0.001$, Table 3). Measured values were subjected to correlation and regression analysis while formulating regression equations for males and females and for combined groups. Table 4 represents regression parameters used to predict total mesiodistal dimension of maxillary & mandibular canine and first and second premolars. Proposed new probability tables for male and female Mysore population are in table 5.

Discussion

Radiographic method to determine sizes of unerupted cuspids and premolars has disadvantages like underexposure / overexposure / distortions of x-rays. Moyers, Tanaka and Johnston, Ballard and Wylie have formulated methods for predicting sizes of unerupted canines and premolars using mesiodistal widths of erupted mandibular permanent incisors.

Although Moyers analysis and T&J are widely used for predicting sizes of unerupted canines and premolars, several studies have contradicted applicability of these prediction methods in non Caucasian population considering ethnic differences in tooth-sizes.^{6,7}

Gender and Ethnic differences:

When combined mesiodistal diameters of lower incisors, mandibular canines and premolars were compared, values were significantly larger in males (LI, $p = 0.02$; LCPM, $p = 0.007$) than females. However, in maxillary arch, though combined widths of canines and premolars of males were larger than females, findings were insignificant ($p = 0.06$). Significant sexual dimorphism was noted in other studies.⁸⁻¹¹ Diagne et al¹² in their study among black Senegalese children showed that mesiodistal diameters of mandibular incisors, maxillary and mandibular canine and premolar segments were greater among males than in females. Similar results were found in other studies.^{13,14}

Definite racial and ethnic differences in tooth-sizes are noted in other where mesiodistal tooth widths were larger in Negroids than in Caucasian.^{15,7}

Comparison of prediction methods with actual values:

We found significant differences between actual values for Mysore sample and those predicted by T&J method² and Moyers 75th percentiles.⁵ In maxillary arch, T&J prediction overestimated combined mesiodistal widths of unerupted permanent canines and premolars by 1.16 ± 0.69 mm among males and 1.10 ± 0.83 mm among females. Percentage overestimation was by 5.65% & 5.55% respectively for males and females.

Moyers prediction (75%) overestimated actual values by 0.59 ± 0.69 mm among males and 0.06 ± 0.87 mm among females which was statistically insignificant. Percentage overestimation was more with T&J method compared to Moyers at 75th percentile.

In mandibular arch, T&J method overestimated measured values of combined mesiodistal widths in males (1.04 ± 0.81 mm) and females (1.39 ± 0.88 mm). Percentage overestimation was by 5.19% and 7.22% in males and females respectively.

Moyers (75%) also overestimated actual values in males (0.83 ± 0.80 mm) and females (0.70 ± 0.91 mm). Percentage overestimation was by 4.18% and 3.74% in males and females respectively. Percentage of overestimation in mandibular arch was more in T&J method than Moyers (75%).

We found that Moyers analysis (75%) and T&J prediction equations were not sufficiently accurate to predict mesiodistal widths of unerupted canines and premolars in Mysore population. This conclusion was consistent with studies that compared Moyers and T&J prediction equations to populations other than Caucasian American children. According to Al-Khadra,¹⁶ Moyers chart at 75th percentile and T&J equations overestimated size of buccal segments in Saudi Arab population. Similar results were obtained by Diagne et al¹² on Senegalese population where T&J equations overestimated actual values. In contrast Schimer and Wiltshire⁷ concluded that Moyers prediction tables underestimated black South African tooth size. According to their results, posterior

teeth would be underestimated by 0.2mm per quadrant if Moyers tables were to be used among Blacks. Under-prediction has also been found with T&J equations in other populations including Asian Americans¹⁷ and Hong Kong Chinese¹⁸. Kaplan et.al¹⁹ found that both Moyers and T&J equations overestimated size of unerupted canines and premolars.

When mean values of lower incisors, upper and lower canines and premolars were considered, present study showed that actual value for upper canines and premolars were coincident with Moyers 65% probability level for males and 35% probability level for females. In contrast Rani and Goel²⁰, when applying Moyers prediction tables to south Indian population found it to be applicable at 35% level, instead of 75% as observed by Moyers for his sample.

Regression equations: Correlation coefficient (r) in present study ranged from 0.46 - 0.60 with highest correlation for males in maxillary arch and females in mandibular arch and least correlation coefficient for males in mandibular arch. Regression coefficients calculated in present study slightly differed from those published by T&J. Interpretation of Mysore subjects indicated that mandibular incisors demonstrated slightly lower correlation, $r = 0.58$ (T&J, $r = 0.62$) and $r = 0.59$ (T&J, $r = 0.65$) for maxillary and mandibular buccal segments. Correlation coefficients for Mysoreans between buccal segments of each arch were smaller than Hong Kong Chinese¹⁸ in both sexes, but, higher than Thai boys²¹ in maxillary buccal segments and black Senegalese girls¹² in mandibular buccal segments. Differences in coefficient values between various ethnic studies illustrate tooth size variability between ethnic groups. Some investigators have shown that use of both sexes together is possible without impairment of results in correlations between sizes of teeth.^{19, 22, 23} However, it is quite clear from results of most odontometric studies that sex dimorphism does exist in mesiodistal widths of permanent teeth.

The standard error of estimate (SEE) indicates error in use of prediction equations; lower SEE, better the prediction equation. SEE in present study ranged from 0.68 - 0.89mm. These were comparable to Hong Kong Chinese¹⁸ group and lower than Thai boys²¹ in both maxillary and mandibular arches.

Conclusion

1. Significant sexual dimorphism in tooth size exists among Mysore population.

2. Commonly used T&J and Moyers (75%) prediction methods were not as accurate when applied to Mysore population since it tends to overestimate actual measurements. Percentage of overestimation was more for T&J than for Moyers (75%).

3. Discrepancies between predicted values and those of present investigation may be attributed to racial and ethnic diversity.

4. For females, Moyers 35th percentile in upper arch and 50th percentile in lower arch; and for males, 65th percentile in upper arch and 50th percentile in lower arch predicted sum of widths of permanent canine and premolars more precisely than commonly used 75th percentile as recommended by Moyers.

5. New regression equations for Mysore population were formulated for predicting mesiodistal widths of unerupted canines and premolar segments for males and females.

Ethical Clearance: Obtained from IEC, JSSDCH.

Source of Funding- Self

Conflict of Interest – Nil

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Table 1: Descriptive statistics including mean, range and standard deviations for mesiodistal widths of lower incisors (LI), upper and lower canines and premolars (UCPM & LCPM).

Gender	Tooth group	N	Mean	S.D	Range
M + F	LI	400	21.97	1.37	18.78 - 24.87
M + F	UCPM	400	20.84	0.91	16.39 – 23.41
M + F	LCPM	400	20.28	1.06	17.33 – 22.96
M	LI	200	22.39	1.28	19.66 – 24.87
M	UCPM	200	21.00	0.85	19.11 – 23.13
M	LCPM	200	20.65	0.89	18.72 – 22.96
F	LI	200	21.5	1.35	18.78 – 24.61
F	UCPM	200	20.68	0.96	18.59 – 23.41
F	LCPM	200	19.93	1.09	17.33 – 22.17

Table 2: Comparison of mesiodistal widths of groups of teeth between male & female participants.

Sum of teeth	Gender	Mean	Standard deviation	p value
Mandibular incisors	M(n=200)	22.39	1.28	0.02
	F(n=200)	21.57	1.35	
Mandibular canines, first and second premolars	M(n=200)	20.65	0.89	0.007
	F(n=200)	19.93	1.09	
Maxillary canines, first and second premolars	M(n=200)	21.01	0.85	0.177
	F(n=200)	20.68	0.96	

Table 3: Comparison of predicted and actual values of mesiodistal widths of canines, first and second premolars between male and female participants in maxillary and mandibular arch.

Maxillary arch				
Gender	Paired difference		t value	p value
	Mean	SD		
Males T and J Moyers 75%	1.169	0.699	9.156	0.001
	0.590	0.699	4.649	0.001
Females T and J Moyers 75%	1.108	0.834	7.274	0.001
	.066	0.871	0.004	0.997
Mandibular arch				
Gender	Paired difference		t value	p value
	Mean	SD		
Males T and J Moyers 75%	1.04877	.81268	7.068	0.001
	.83867	.80851	5.682	0.001
Females T and J Moyers 75%	1.39700	.88085	8.687	0.001
	.70167	.91730	4.190	0.001

Table 4: Details of regression analysis among study participants

Canine premolar segment	Gender	Correlation coefficient (r)	Coefficients of determination (r ²)	Regression coefficient		Std error of estimate (SEE)
				A	B	
Mandibular arch	M	0.46	0.21	10.40	0.32	0.79
	F	0.60	0.36	9.29	0.49	0.89
	M + F	0.59	0.353	10.20	0.45	1.11
Maxillary arch	M	0.60	0.36	12.05	0.40	0.68
	F	0.52	0.28	12.56	0.37	0.83
	M + F	0.58	0.34	12.25	0.39	0.75

Table 5: Probability table for predicting the mesiodistal crown diameters of unerupted canine and premolars for males

Maxillary canine and premolars among males

$\Sigma 21/12 = 20.0 \ 21.0 \ 22.0 \ 23.0 \ 24.0 \ 25.0$

95% 21.28 20.71 21.89 22.13 22.76 22.96

85 % 21.09 20.70 21.86 21.63 22.75 22.54

75 % 20.60 20.64 21.58 21.38 22.73 22.50

65% 20.49 20.62 21.33 21.21 22.18 22.47

50 % 20.32 20.82 20.95 21.10 21.36 21.92

35% 19.55 19.78 20.54 20.76 21.32 21.56

25 % 19.11 19.50 20.31 20.72 21.30 21.42

15 % 19.00 19.47 20.14 20.48 21.18 21.27

5 % 18.84 18.95 20.13 20.33 20.98 21.12

Mandibular canine and premolars among males

95% 20.36 20.47 22.23 22.96 21.59 22.46

85 % 20.30 20.38 22.19 21.57 21.40 22.35

75% 20.23 20.35 21.64 20.77 21.38 22.29

65 % 20.15 20.33 21.18 20.63 21.14 22.24

50% 20.04 19.95 20.66 20.42 20.76 21.86

35% 19.24 19.57 20.35 20.32 20.59 21.47

25% 18.72 19.60 20.15 20.28 20.48 21.33

15 % 18.67 19.53 19.82 20.06 20.45 21.20

5 % 18.50 19.40 19.80 19.52 20.43 21.01

Maxillary canine and premolars among females

$\Sigma 21/12 = 20.0 \ 21.0 \ 22.0 \ 23.0 \ 24.0$

95% 20.69 20.35 21.58 22.01 22.45

85 % 20.65 20.33 21.51 21.00 22.43

75 % 20.50 20.28 21.21 21.56 22.50

65% 20.41 20.14 21.33 21.11 22.00

50 % 19.98 19.79 20.89 21.04 21.36

35% 19.45 19.38 20.78 20.66 21.20

25 % 19.00 19.12 20.50 20.72 20.79

15 % 18.68 18.99 20.10 20.38 20.45

5 % 18.59 18.80 20.09 20.30 20.24

Mandibular canine and premolars among females

95% 20.20 20.88 22.17 22.28 21.85

85 % 20.00 20.78 21.53 21.18 21.84

75% 19.59 20.66 21.60 20.10 21.80

65 % 20.15 20.22 21.46 20.89 21.49

50% 19.40 19.41 20.17 20.65 20.97

35% 19.10 18.63 20.03 19.95 20.49

25% 18.21 18.25 19.81 19.80 20.18

15 % 17.63 18.16 19.55 19.50 20.10

5 % 17.33 18.06 19.07 19.42 20.06

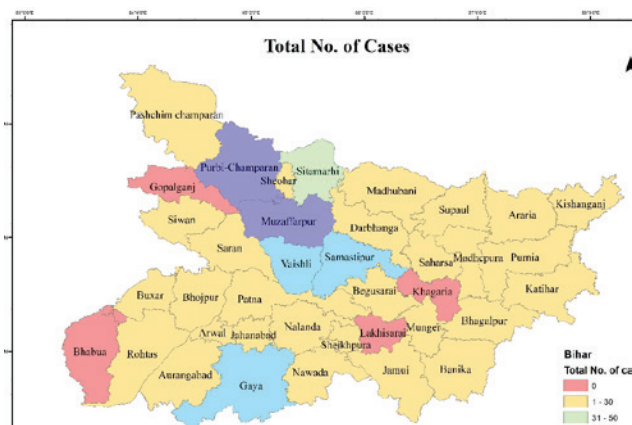


Figure 1: Measurements taken perpendicular to the long axis of the tooth using digital calliper.

A Study of Handgrip Strength in Patients with Rheumatoid Arthritis: Its Correlations with Functional and Anthropometric Variables

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Abstract

Background: Rheumatoid arthritis (RA) is a chronic, systemic inflammatory disorder that primarily affects the small joints of hand. In the present study, hand grip strength was estimated on purposively selected 205 patients with RA aged 25-65 years. Correlations of handgrip strength have also been studied with some anthropometric and functional variables in patients with RA.

Materials and methods: The subjects were assessed for handgrip strength (both dominant and non-dominant), two functional variables, i.e. pain and pain today, and eight anthropometric variables namely, height, weight, BMI, hand and upper arm circumferences, forearm, upperarm and total arm length with standard techniques.

Results: It was observed that the patients with RA had significantly lesser ($p < 0.001$) handgrip strength than controls. It was also found that both younger and older patients had significantly lesser ($p < 0.001$) handgrip strength than their control counterparts. Handgrip strength of patients with RA showed significant positive correlations with height and hand circumference, and significant negative correlations with pain today, forearm and upper arm length

Conclusion: It might be concluded that handgrip strength had significant reduction in patients with RA as compared to controls. Moreover, handgrip strength had significant correlations with some functional and anthropometric variables.

Keywords: Handgrip strength, anthropometric variables, functional variables, patients with rheumatoid arthritis.

Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory disease that affects mainly the small joints of hand. Its prevalence was reported as approximately 0.5% to 1% among adults worldwide [1,2]. Patients with RA were found to have progressive loss of hand function and significantly weaker handgrip strength than controls [3]. Though the cause of RA is not completely understood, the etiology of loss of hand function depends upon number of factors, i.e. joint deformity and inflammation, pain and decreased muscle strength [4-5].

The evaluation of handgrip strength could be successfully used as a tool to detect the reduction in hand

function in patients with RA. In fact, handgrip strength is found as a reliable indicator for total body strength [6-7] and also for frailty [8].

In spite of being an important indicator of body strength, very few references are available regarding the estimation of handgrip strength in patients with RA in north Indian population, thus, the present study was undertaken.

Materials and Method

Samples: A total of 205 patients with RA (stabilized on medicine) from both sexes, (87.80% females) aged 25-65 years were selected purposively from the OPD of Christian Medical College, Ludhiana, Punjab and

Satguru Partap Singh Hospital, Ludhiana, Punjab, India. Further, the subjects were divided into two groups, younger patients (aged 25-45 years) and older patients (aged 46-65 years). An adequate number of controls (n=203) were taken too for comparisons. Prior to the study, a written consent of the subjects were taken. The study was approved by Institutional Ethical Committee.

Measurement of hand grip strength: Handgrip strength (kg) was estimated with the help of Jamer hand dynamometer (Sammons Preston Tnc., Boilingbrook,IL) in kg. The subject was instructed to exert maximum force thrice on the dynamometer held by them. The maximum value was considered.

Functional variables: A modified HAQ (MHAQ) described by Pincus et al. [9] was used to estimate two functional variables, i.e. pain and pain today.

Anthropometric variables: Eight anthropometric variables namely height, weight, BMI, hand and upper arm circumferences, forearm, upper arm and total arm length were measured after Lohmann et al. [10]. The height of the subjects was measured by Stadiometer (Holtain Ltd. Crymych, Dyfed, UK) in cm and the weight by using standard weighing machine (Model DS-410, Seiko, Tokyo, Japan) to the nearest 0.1 kg. Body mass index (BMI) was derived by the formula: $BMI = \text{weight (kg)} / \text{height}^2 (\text{m}^2)$. The hand and upper arm circumferences were measured by a flexible metallic tape (Holtain Ltd) in cm. The forearm, upper arm and total arm length were measured by the first segment of the anthropometric rod in cm.

Statistical Analysis

Standard descriptive statistics (mean and standard deviation) were analysed for directly measured and derived variables using SPSS (Statistical Package for Social Science) version 20.0. Student's t-test was applied for the comparison of data between patients with RA and controls, also between younger and older patients. Pearson's correlation coefficients of handgrip strength were made with selected functional and anthropometric variables in patients with RA. To indicate statistical significance, 5% level of probability was used.

Results

Table 1 showed the descriptive statistics of handgrip strength, selected functional and anthropometric variables in patients with RA. The patients had significantly ($p < 0.001$) lower mean values both in DHGS and NDHGS ($t = 4.781$ and 5.727 respectively), HT ($t = 8.054$), WT ($t = 4.106$), HC ($t = 3.925$), UAC ($t = 5.127$), FAL ($t = 3.965$) and TAL ($t = 5.479$), and significantly ($p < 0.001$) higher mean values in PN ($t = 23.226$) and PNT ($t = 10.555$) than their control counterparts.

The descriptive statistics of handgrip strength, selected functional and anthropometric variables in patients with RA of age groups 25-45 years and 46-65 years were shown in Table 2. The younger patients of age group 25-45 years had significantly ($p < 0.013-0.001$) lower mean values in age ($t = 27.496$), WT ($t = 2.483$) and BMI ($t = 3.860$), and significantly ($p < 0.001$) higher mean values both in DHGS and NDHGS ($t = 4.781$ and 5.727 respectively) than their older patient counterparts.

Table 1: Descriptive statistics of handgrip strength, functional and selected anthropometric variables in patients with RA and controls

Variables	Patients with RA (n = 205)		Controls (n = 203)		t- test	p-value
	Mean	SD	Mean	SD		
Age (years)	48.25	11.27	46.56	13.60	1.369	0.172
DHGS (kg)	16.22	6.80	19.66	7.69	4.781	<0.001
NDHGS (kg)	15.26	5.34	18.85	7.16	5.727	<0.001

Cont... Table 1: Descriptive statistics of handgrip strength, functional and selected anthropometric variables in patients with RA and controls

PN	5.57	2.35	1.31	1.10	23.226	<0.001
PNT	3.50	3.16	1.09	0.65	10.555	<0.001
HT (cm)	157.97	6.89	163.97	8.12	8.054	<0.001
WT (kg)	64.05	11.56	68.89	12.24	4.106	<0.001
BMI (kg/m ²)	25.65	4.22	25.60	4.02	0.128	0.898
HC (cm)	24.45	3.42	25.98	4.40	3.925	<0.001
UAC (cm)	27.67	5.03	30.53	6.18	5.127	<0.001
FAL (cm)	23.15	5.22	24.75	2.43	3.965	<0.001
UAL (cm)	26.70	5.92	26.98	2.63	0.587	0.558
TAL (cm)	64.81	11.36	69.73	5.90	5.479	<0.001

DHGS= dominant handgrip strength, NDHGS= non-dominant handgrip strength, PN= pain, PNT= pain today, HT= height, WT= weight, BMI= body mass index, HC= hand circumference, UAC= upper arm circumference, FAL= forearm length, UAL= upper arm length and TAL= total arm length.

The correlation coefficients of handgrip strength with other variables in patients with RA were shown

in Table 3. DHGS had positive significant correlations ($p < 0.008-0.001$) with NDHGS ($r = 0.800$), HT ($r = 0.312$) and HC ($r = 0.185$), and significant negative correlations ($p < 0.017-0.001$) with age ($r = -0.167$), PNT ($r = -0.320$), FAL ($r = -0.249$) and UAL ($r = -0.301$). Whereas, NDHGS had positive significant correlations ($p < 0.050-0.001$) with HT ($r = 0.310$), WT ($r = 0.173$) and HC ($r = 0.135$), and significant negative correlations ($p < 0.041-0.001$) with age ($r = -0.143$) and PNT ($r = -0.327$).

Table 2: Descriptive statistics of handgrip strength, selected functional and anthropometric variables in patients with RA of age group 25-45 years and 46-65 years

Variables	Patients with RA aged 25-45 years (n = 74)		Patients with RA aged 46-65 years (n = 131)		t- test	p-value
	Mean	SD	Mean	SD		
Age (years)	36.23	6.96	55.05	6.59	27.496	<0.001
DHGS (kg)	17.66	7.04	15.41	6.55	5.041	<0.001
NDHGS (kg)	16.34	5.48	14.65	5.19	3.451	<0.001
PN	5.82	2.32	5.42	2.37	1.264	0.207
PNT	3.40	2.77	3.56	3.37	1.422	0.156
HT (cm)	158.21	8.23	157.84	6.04	1.791	0.074

Cont... Table 2: Descriptive statistics of handgrip strength, selected functional and anthropometric variables in patients with RA of age group 25-45 years and 46-65 years

WT (kg)	61.93	10.98	65.25	11.74	2.483	<0.013
BMI (kg/m ²)	24.74	3.85	26.16	4.35	3.860	<0.001
HC (cm)	24.18	3.56	24.60	3.34	1.002	0.317
UAC (cm)	27.31	5.19	27.88	4.95	0.375	0.708
FAL (cm)	23.28	5.50	23.08	5.08	0.254	0.800
UAL (cm)	26.80	5.70	26.66	6.07	0.153	0.878
TAL (cm)	64.28	11.30	65.12	11.43	0.340	0.734

Table 3. Correlation coefficients of handgrip strength with other variables in patients with RA

Variables	DHGS		NDHGS	
	r-value	p-value	r-value	p-value
NDHGS (kg)	0.800	<0.001	-	-
Age (years)	-0.167	<0.017	-0.143	0.041
PN	-0.027	0.701	-0.124	0.076
PNT	-0.320	<0.001	-0.327	<0.001
HT (cm)	0.312	<0.001	0.310	<0.001
WT (kg)	0.102	0.153	0.173	<0.013
BMI (kg/m ²)	0.100	0.154	0.175	<0.011
HC (cm)	0.185	<0.008	0.135	<0.050
UAC (cm)	0.030	0.673	0.086	0.220
FAL (cm)	-0.249	<0.001	-0.131	0.061
UAL (cm)	-0.301	<0.001	-0.109	0.119
TAL (cm)	-0.091	0.196	0.020	0.771

Discussion

The findings of the present study demonstrated significant ($p < 0.001$) lesser mean values of dominant and non-dominant handgrip strength in patients with RA than controls. Several studies showed significant reductions in handgrip strength in patients with RA in comparison to controls [11-12]. Alomari *et al.* [13] also reported a 30% reduction in handgrip strength in patients with RA than controls. In the present study too, 21.21%

reduction was noted in dominant and 23.52% in non-dominant handgrip strength in the patients. Beenakkar *et al.* [3] conducted a meta-analysis and reported a decline of handgrip strength before the age of 50 years in the patients with RA and suggested that the disease might cause premature aging. Lenardt *et al.* [14] reported the additional declination of handgrip strength in older patients as compared to younger patients. Our study also followed the identical type of findings.

Several studies reported considerable reduction of muscular strength (including handgrip strength) in patients with RA than age-matched healthy controls [15-17,8]. They also opined that reduced muscle strength was probably due to reduction of muscle mass and disuse atrophy. In fact, rheumatoid cachexia, a term used in RA, was defined as a loss of skeletal muscle mass [18,19]. However, Helliwell and Jackson [20] reported earlier that the reduction in handgrip strength in patients with RA was more than the reduction in muscle size and the reports were confirmed later by other findings too [16, 21].

When the comparisons of mean values of dominant and non-dominant handgrip strength of patients with younger age group (i.e. 25-45 years) and older age group (i.e. 46-65 years) were made, the older patients had significantly ($p < 0.001$) lesser mean values than their younger patient counterparts. Lenardt et al. [14] reported the additional declination of handgrip strength in older patients group as compared to the younger patients, similar to findings of our study. The excessive loss of handgrip strength in older patients was, might be, due to the excessive loss of muscle mass that occurred after the age of 40 years.

In the other aspects of our study, handgrip strength of patients with RA showed significant positive correlations with height and hand circumference, and significant negative correlations with pain today, forearm and upper length. Fraser et al. [16] reported that dominant handgrip strength of patients with RA was 20% weaker than the non-dominant ones, though the correlations were non-significant. da-Silva *et al.* [11] also reported non-significant correlation of handgrip strength and hand dominance. The findings of our study contradicted the findings of both the studies, highlighting significant positive correlation of dominant handgrip strength with non-dominant hand in patients with RA. In fact, the dominant handgrip strength was reported to be stronger than that of the non-dominant side [22]. Nevertheless, Age exhibited significant negative correlation both with dominant and non-dominant handgrip strength in the present study, contradicting the earlier reports [23-24, 3, 11]. A study conducted by Pollard et al. [25] reported that rheumatoid arthritis has worse consequences on physical function, pain and disability. Physical function was impaired due to disability and pain. Our findings also supported the above mentioned study.

The findings of Sirajudeen et al. [22] indicated that both dominant and non-dominant handgrip strength of healthy south Indian population had positively significant correlations with height, weight and BMI. The present study also showed the significant positive correlations of dominant handgrip strength only with height, and of non-dominant handgrip strength with height and weight. In another study, significant positive correlations of handgrip strength were noted with height and weight but not with BMI in healthy Malaysian population aged 18-65 years [26]. Sirajudeen et al. [22] and MacDermid *et al.* [27] reported significantly positive correlations of both dominant and non-dominant handgrip strength with hand anthropometry. The findings of our study followed the same directions, highlighting significant positive correlations of both dominant and non-dominant handgrip strength with hand circumference in patients with RA.

Conclusion

From the findings of the present study, it could be concluded that the patients with rheumatoid arthritis had significant reduction in handgrip strength as compared to controls. Both dominant and non-dominant handgrip strength had significant positive correlations with height and hand circumference and significant negative correlations with age, pain today, forearm and upper arm length in patients, highlighting impact of functional and anthropometric variables on handgrip strength.

Financial support and sponsorship: Nil.

Conflicts of Interest: There are no conflicts of interest.

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Prevalence of Hypertension and its Associated Risk Factors among People Living in Rishikesh, Uttarakhand

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Abstract

Background: India is in a state of epidemiological, economic, demographic and nutrition transition. And all these transitions are leading to non communicable diseases. Hypertension is a major public health problem and important area of research due to its high prevalence and being major risk factor for cardiovascular diseases and other complications.

Objectives: To find out the prevalence of hypertension and its associated risk factors among people living in study area.

Methodology: It is a community based cross sectional study conducted among people living in Barrage colony of Rishikesh, Uttarakhand. House to house survey was conducted for 3 months from December 2018 to February 2019 in all the four blocks (A,B,C,D) of Barrage colony, Rishikesh, Uttarakhand, to make a sample size of 955. Both male and female age of 15 years and above was included in the study.

Results: The prevalence of hypertension among study participants was 10.4%. Prevalence of hypertension was found more in male subjects (12.6%) as compared to females subjects (6.9%). The risk factors found to be significantly associated with HTN in this study were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake.

Conclusion: There is significant burden of hypertension in Barrage colony, Rishikesh. Strong public health measures need to be seriously implemented to combat hypertension and its consequences.

Keywords –Epidemiological transition, Prevalence, Non communicable diseases, Hypertension

Introduction

India is undergoing a rapid epidemiological transition with the increase in the incidence of noncommunicable diseases (NCD), such as cardiovascular diseases (CVD), cancer, chronic obstructive pulmonary disease, stroke, chronic kidney disease (CKD), and blindness, some of which are often referred to as lifestyle diseases. Among them, systemic hypertension is a very important disorder

by itself and is also a strong risk factor for CVD, stroke, and CKD^{1,2}. Systemic arterial hypertension is defined as a state of chronically elevated arterial blood pressure, as compared to what is normally expected, as per the defined level given in JNC-VII. Prehypertension is also associated with an increased risk of major cardiovascular events, independent of other cardiovascular risk factors³.

The recent WHO report states that considering the prevalence of any diseases, hypertension ranks fourth in the world⁴. As it is hidden beneath an outwardly asymptomatic appearance, the disease does immense harm to the body in the form of “Target organ” damage hence the WHO is named it the “silent killer”⁴. Hypertension affects approximately 1 billion people worldwide. Raised blood pressure is estimated to cause

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about 7 million premature deaths throughout the world, and 4.5% of the disease burden (64 million disability-adjusted life years (DALYs)⁴.

Hypertension is one of the commonest non-communicable diseases in India, with an overall prevalence of 29.8% among the adult population⁴. Recent studies showed that for every known person with Hypertension, there are two persons with either undiagnosed Hypertension or prehypertension. Various community-based studies have recorded prevalence of Hypertension in India to be ranging from 30%–40% in urban and 10–20% in rural areas. It is directly responsible for 57% of all stroke deaths and for 24% of cases of coronary heart diseases in India. Only scant data are available on the prevalence of risk factors in different geographical areas in India⁵.

In Uttarakhand, hypertension is more prevalent in males (13.1%) than females (7.2%) as per NFHS 4 estimates⁶.

There is an urgent need to check the increasing burden of Hypertension. This study was undertaken to know the actual burden of Hypertension and its risk factors in rural areas to facilitate the planning of strategies for prevention and control and to facilitate the surveillance of risk factors.

Objectives

1. To estimate the prevalence of hypertension among people living in Barrage colony, Rishikesh, Uttarakhand.
2. To estimate the risk factors associated with hypertension among people living in Barrage colony, Rishikesh, Uttarakhand.

Methods and Materials

Study Design: Cross sectional community based study.

Study Area: Barrage colony, Rishikesh, Uttarakhand

Study Period: Threemonths from December 2018 to February 2019

Study Subjects :People aged 15 years and above

who are the permanent residents in the Barrage colony, Rishikesh, Uttarakhand.

Sampling Technique: :People living in all the 4 blocks (A,B,C,D) of Barrage Colony were included in the study by house to house survey, and we were able to collect demographic data on all residents, though some residents refused to undergo full assessment, making a total sample size of 955.

Inclusion criteria:

1. All individuals (male and female) more than and equal to 15 years.
2. All those who gave consent to participate.

Exclusion criteria:

1. Individuals less than 15 years of age.
2. Those absent on the day of visit and did not give consent to participate in study.

Data Collection: A detailed history was obtained by interview using a pretested and semi-structured questionnaire, to collect data on socio-demographic factors, co-morbidities, lifestyle and anthropometric measurements of height, weight, body mass index (BMI), waist circumference, and waist-hip ratio (WHR) were assessed using standard guidelines⁷.

Blood pressure measurements :

BP was measured twice (10 minutes apart) for each study subject, with a calibrated mercury sphygmomanometer using standard guidelines.⁸ It was measured to the nearest 2 mm Hg and the average of two readings was taken as the mean BP.

HTN definition :HTN was defined as sustained elevation of systolic BP ≥ 140 mmHg and /or diastolic BP ≥ 90 mmHg, and also included study subjects who were on antihypertensive medication (JNC 7)⁹.

Statistical Analysis:Data was entered in Microsoft excel and analysed using SPSSv21. Pearson's Chi square test was applied. P value < 0.05 was considered significant. All the statistical significances were evaluated as 95% confidence interval.

Results

In our study out of total 955 participants, 440 (46.07%) were males and 515 (53.9%) females. Majority of study participants belonged to the age group 25-34 years 235 (24.6%), were married 883 (92.4%), were literate 903 (94.5%), Hindu 798 (83.7%) and employed 492 (51.5%).

Table 1 depicts that Out the 955 study subjects, there were 99 hypertensives, as per JNC 7 classification.

The prevalence of HTN was 10.4%. Among the hypertensives, 57 (57.6%) were previously diagnosed cases of HTN while 42 (42.4%) were new cases detected in this study.

Table 2 shows that The prevalence of HTN was found to increase with age, male gender, central obesity (high WHR), overweight, diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake. and this association was found to be statistically significant ($p < 0.05$).

Table 1: Prevalence and category of hypertension among study subjects

Category of Hypertension	Number	Percentage (%)
By JNC VII classification of HTN (n=955)		
Normotensives	856	89.6
Hypertensives	99	10.4
By new and old cases of HTN (n=99)		
Newly diagnosed cases	42	42.4
Previously diagnosed cases	57	57.6

Table 2: Association between probable risk factors and HTN

S.No.	Category	Hypertensives No.(%)	Normotensives No. (%)	Total (%)	P value
1.	Age				
	15-34	17 (5.2)	309 (94.8)	326 (34.1)	P < 0.05
	35-54	31 (7.6)	377 (92.4)	408 (42.7)	
	55-74	51 (23.1)	170 (76.9)	221 (23.2)	
2.	Sex				
	Male	62 (14.1)	378 (85.9)	440 (46.1)	P < 0.05
	Female	37 (7.2)	478 (92.8)	515 (53.9)	
3.	H/o Salt intake				
	High (>5gm)	75 (31.9)	160 (68.1)	235 (24.6)	P < 0.05
	Normal	24 (3.4)	696 (96.6)	720 (75.4)	
4.	H/o Diabetes				
	Yes	85 (56.7)	65 (43.3)	150 (15.7)	P < 0.05

Cont... Table 2: Association between probable risk factors and HTN

	No	14 (1.7)	791 (98.3)	805 (84.3)	
5.	H/o dyslipidemia				
	Yes	90 (36.6)	156 (63.4)	246 (25.8)	P < 0.05
	No	9 (1.3)	700 (98.7)	709 (74.2)	
6.	Physical activity				
	Yes	25 (7.1)	325 (92.9)	350 (36.6)	P < 0.05
	No	74 (12.2)	531 (87.8)	605 (63.4)	
7.	Central obesity: Waist-Hip Ratio (WHR)				
	High	82 (28.4)	207 (71.6)	289 (30.3)	P < 0.05
	Normal	17 (2.6)	649 (97.4)	666 (69.7)	
8.	Smoking				
	Yes	78 (20.8)	297 (79.2)	375 (39.3)	P < 0.05
	No	21 (3.6)	559 (96.4)	580 (60.7)	
9.	Alcohol				
	Yes	62 (17.7)	288 (82.3)	350 (36.6)	P < 0.05
	No	37 (6.1)	568 (93.9)	605 (63.4)	
10.	General Obesity (BMI)				
	Overweight/obese	75 (31.9)	160 (68.1)	235 (24.6)	P < 0.05
	Normal weight	24 (3.4)	696 (96.6)	720 (75.4)	

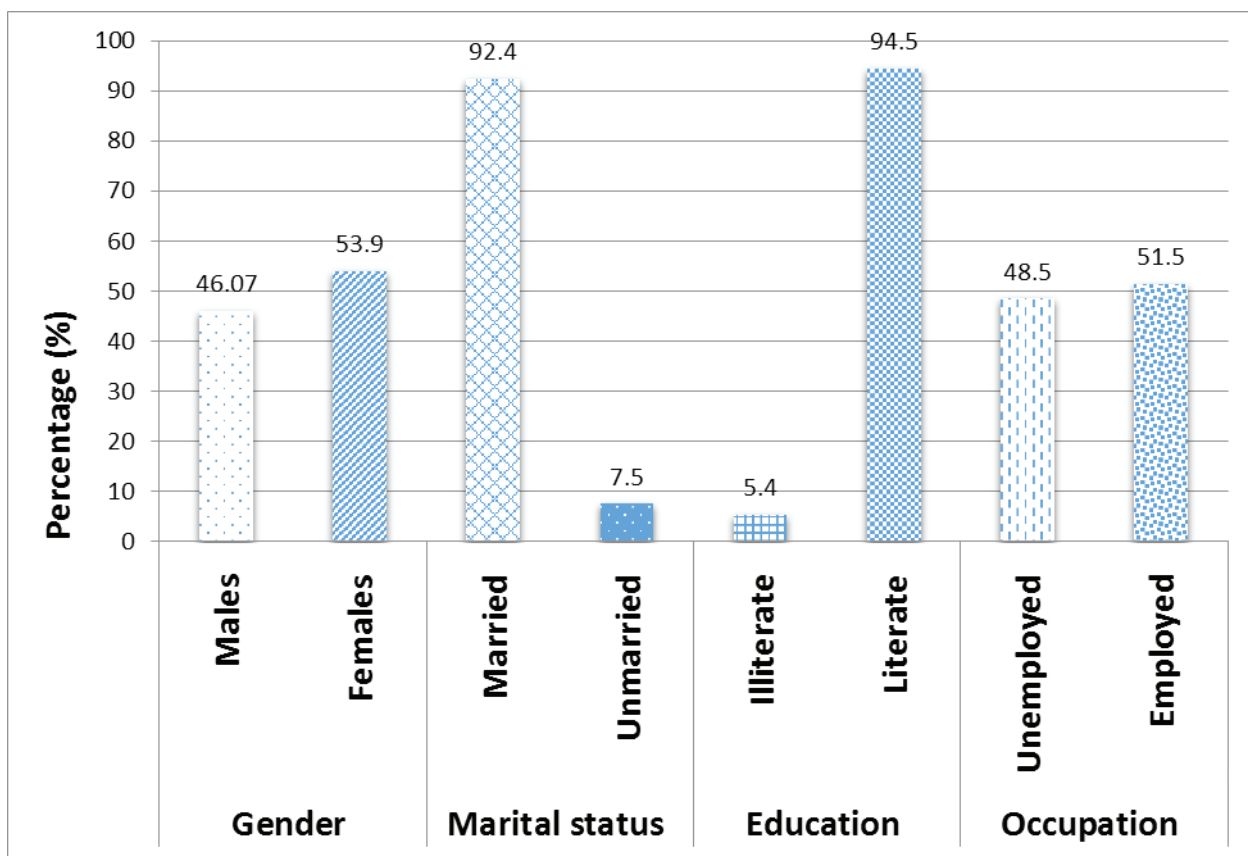


Fig 1: Distribution of study subjects according to socio-demographic characteristics

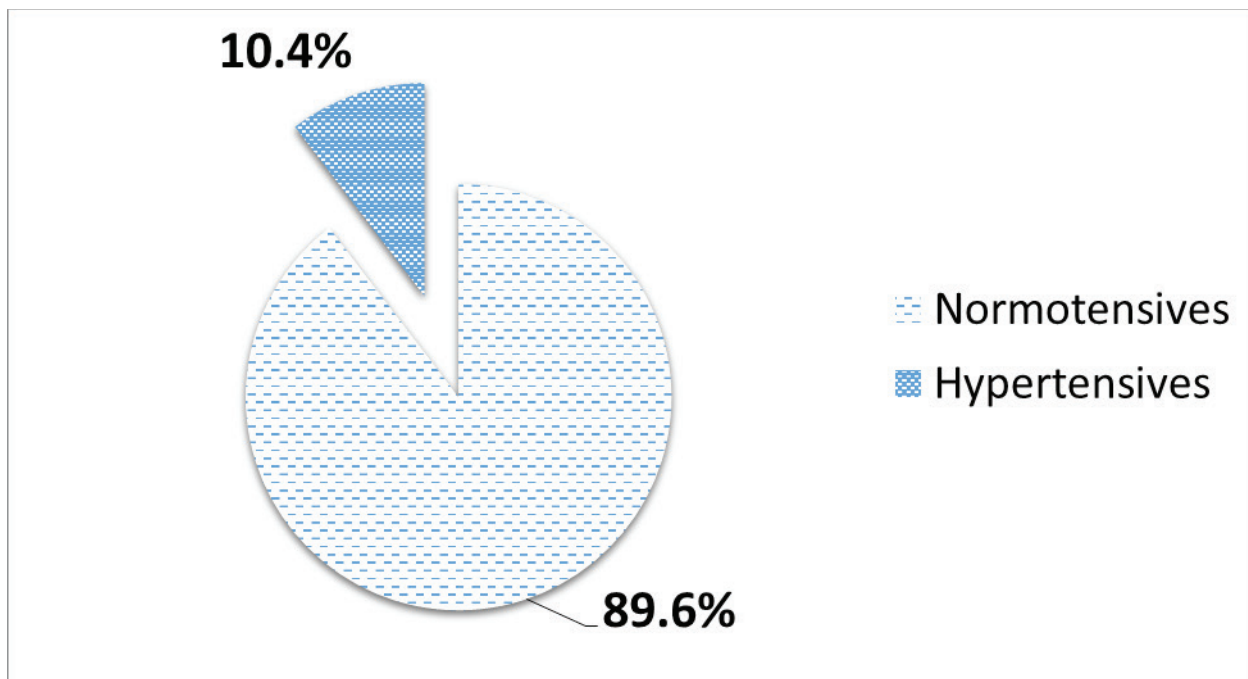


Fig 2: Prevalence of hypertension among study participants

Discussion

In our study, 99 were found to have hypertension giving a prevalence of 10.4%. Among them 57.6% of hypertensives were already diagnosed to have HTN while 42.4% were newly detected hypertensives. This shows the submerged portion of the iceberg.

A similar study conducted by Chethana KV et al.¹⁰ in Karnataka, in urban people aged 18-65 years in 2017 showed higher prevalence of hypertension in men (37.3%) than in women (28.9%).

In our study there was increased prevalence of HTN as age increases which is similar to study done by Chethana KV et al.¹⁰ and Simon C et al.¹¹.

In our study the risk factors found to be significantly associated with HTN were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake which is similar to study done by Chethana KV et al.¹⁰, Simon C et al.¹¹, Kannan et al.¹² and Prasanth et al.¹³

Conclusion

The prevalence of hypertension among study participants in Barrage colony, Rishikesh, was 10.4%. Prevalence of hypertension was found more in male subjects (14.1%) as compared to female subjects (7.2%). The risk factors found to be significantly associated with HTN in this study were increasing age, male gender, central obesity (high WHR), diabetes, smoking, alcohol, sedentary lifestyle and excess salt intake. The results of this community-based cross-sectional study points to the multi-factorial etiology of hypertension.

Recommendations

This study brought to our notice that Hypertension in the study area was a significant problem. It also revealed that lifestyle risk factors were highly prevalent and significantly associated with the disease. There is plenty of scope for early detection and control of risk factors and motivation/education for risk factor modification/prevention of establishment of risk factors. There was also a need for the early detection of prehypertension and established Hypertension and for the treatment of the affected individuals through appropriate community-based screening and treatment

strategies. This study provided useful data for planning and implementing Hypertension prevention programs in the community. Creating awareness about the harmful effects of sedentary lifestyle, central obesity, use of excess salt and alcohol and smoking should be initiated in the community.

Limitation of the study:

As this study was done in small area so the results obtained cannot be generalized to the whole population.

Relevance of the study

Hypertension is a very important disorder by itself and is also a strong risk factor for CVD, stroke, and CKD. Studies showed that for every known person with Hypertension, there are two persons with either undiagnosed Hypertension or prehypertension. There is an urgent need to check the increasing burden of Hypertension.

Acknowledgement: The authors are grateful to the Head of Department of Community and Family Medicine, Professor Surekha Kishore, for her help and support in conduction of the study and residents of Barrage Colony of Uttarakhand for their cooperation and participation in the study.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Approval: Ethical approval was taken from institutional ethical committee of AIIMS, Rishikesh.

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Prevalence of Ocular Conditions Causing Low Vision & the Low Vision Aids Dispensed at a Tertiary Eye Care Centre in Sangli, India

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Abstract

Introduction: The prevalence of visual impairment and blindness is not alien to India. The current study is done in order to understand the causes and management options of low vision and blindness among various age groups in a tertiary eye care centre in Sangli, India.

Methods: In our retrospective study, data of the subjects were obtained from Nandadeep Eye Hospital, Sangli, India. Information of 102 patients who had attended the Low vision evaluation from 1st January 2016 to 30th November 2017 was collected after seeking consent from hospital authorities. Demographic and clinical data were assessed and analysed (descriptive analysis) using SPSS software version 23.

Results: A total of 124 patients were referred to the low vision clinic of Nandadeep eye hospital, Sangli, from 2016 – 2017. Among them, 22 patients were excluded from the study. There were 65(63.7%) Males with a mean age of 47.7 years. Among 102 low vision patients. Prevalence of Diabetic retinopathy (16.6%) was found to be higher among different diseases causing low vision, and the most commonly dispensed aid was spectacle magnifier with BI prism (70, 57%).

Conclusion: - In India, the prevalence of diabetic retinopathy (16.6%) was higher among different diseases causing low vision. Among various low vision aids, spectacle magnifiers with BI prism, 57% were most commonly dispensed.

Keywords: *Low vision, Low vision Aids, Ocular diseases, Prevalence, Spectacle magnifiers.*

Introduction

The World Health Organization (WHO 1922) describes a person with low vision as “one who has impairment of visual function, even after treatment and/or standard refractive correction, and has a visual acuity less than 6/18 [the metric equivalent of 20/200] to light perception or a visual field of less than ten degrees from the point of fixation, but who uses or is potentially able to use, vision for the planning and/or execution of task”.¹

Globally, uncorrected refractive errors are the leading cause of moderate and severe visual impairment; cataracts remain the leading cause of blindness in middle and low-income countries.¹ At the outset, numerous

ocular diseases cause low vision. The few most common causes of low vision include macular degeneration, diabetic retinopathy, retinitis pigmentosa, amblyopia, retinopathy of prematurity, retinal detachment, and glaucoma.² In developed nations, low vision is seen predominantly among the age group of above 75 years.^{3,4}

Furthermore, vision loss does not directly need to affect the peoples’ ability to do a task but changes the way the person does or executes it. The life activities of the person do not change with the loss of vision. New approaches and methods of adaptation to the task need to be looked at. The persons with visual impairment face difficulty in reading and writing, orientation and mobility, driving, grooming, recognizing faces, ascending and

descending stairs, identifying currency notes, food, etc. Few studies have shown that the prevalence of low vision is up to 60% among the elderly population.⁵⁻⁹

There are numerous devices, techniques, and resources for the persons with visual impairment to remain independent, including devices that use relative size magnification, contrast, and colour enhancement techniques, using audio, reorganizing the visual environment, and many more. The devices may be electronic, optical, and non-optical.

Moreover, low vision is a significant public health problem & provision of low vision services is one of the priorities in the global initiative, Vision 2020- The right to Sight. Albeit the prevalence of visual impairment and low vision is increasing, the uptake continues to be relatively small in developing countries like India². The current study is done to understand the causes and management options for low vision patients.

There are few studies done on the same lines. According to literature, age-related macular degeneration was one of the leading causes of low vision among the elderly population¹⁰⁻¹⁵. The second leading cause was retinitis pigmentosa^{12,16,17} and diabetic retinopathy^{10,18}. Some of the other causes were optic atrophy¹⁹, cataract¹², glaucoma²⁰, etc. Among the pediatric population, the leading causes for low vision, according to literature, were nystagmus^{14,17}, congenital cataract¹⁴, amblyopia¹⁶, degenerative myopia¹⁷ and retinitis pigmentosa.

The management given to the patient with low vision can be optical, non-optical, or both with environmental modifications. In many studies, there are various types of devices advised for the management of low vision patients. According to literature, spectacle magnifiers were dispensed maximally to the patients with difficulties^{10,16,21,22}, followed by telescopes^{16,17,23}, other types of magnifiers^{10,23}, and video magnifiers¹⁷.

Method

In our study, we aimed to estimate the prevalence of different diseases causing low vision & the low vision aids dispensed at a tertiary eye care center. The study was approved by the institution board, Naseema Institute of Optometry and Research, Bangalore, India. The study was following the tenets of the declaration of Helsinki.

The clinical records of the patients were taken, and a retrospective study was conducted from December 2017 to 2018 at the Low vision department of Nandadeep Eye Hospital at Sangli, India. Records of patients having vision less than 6/18 in the better eye, and to whom the low vision aids were dispensed were included in the study. Incomplete records were excluded.

Data of 124 patients who visited Nandadeep eye hospital, low vision clinic from 1st January 2016 – 30th November 2017 were obtained. Among the 124, 22 were excluded from the study based on exclusion criteria. A total of 102 individuals with low vision were considered for the study. Patients underwent a comprehensive clinical low vision examination. Details were taken, which included demographic information like age {which was further divided into four categories²⁴ 1. Children (<18 Yrs), 2. Young adults (18-35 Yrs), 3. Middle-aged adults (36-55 Yrs), 4. Older adults (>55 Yrs)}, and gender. Clinical information included ocular diagnosis, the low vision aid prescribed to the patient, and high contrast visual acuity pre and post low vision aids trial. The descriptive data analysis was done using SPSS V16.

Results

A total of 102 individuals with low vision were considered for the study, which included a majority of males n=65 (63.7%). The mean age was 47.7 years, with a standard deviation of ± 40 . Majority n=44, (43.1%) were aged above 55 years (Older adults), n=25 (24.5%) were middle-aged adults (36-55 years), 15(14.7%) were young adults (18-35 years) and n=18 (17.6%) were children (<18yrs) in our study.

Among 102 participants, the most common condition causing low vision was diabetic retinopathy (DR) (16.6%), followed by age-related macular degeneration (ARMD) (14.7%), and retinitis pigmentosa (RP) (14.7%) equally, and lastly, glaucoma (11.7%). Similarly, a minority of participants were having conditions like chorioretinal atrophy, heredomacular degeneration, serpiginous choroiditis, choroidal coloboma (<1%), etc. as shown in Figure 1.

Among the participants, most commonly dispensed aid was spectacle magnifiers with BI prism n=70, (57%), other handheld magnifiers n=29, (23.5%), followed by

handheld monocular telescopes n=21, (17%), and very few numbers of handheld video magnifiers n=3, (2.5%).

Among the 18 children (<18years), RP (50%), optic atrophy (16%) were the most common cause. RP (26.6%), albinism (20%) were the most common cause in younger adults (18-35yrs). In contrast, diabetic retinopathy (28%), glaucoma (24%) were the most prevalent causes in middle-aged adult (36-55 years) patients. ARMD (29.5%) and diabetic retinopathy (22.7%) were the commonest in older adults (>55yrs). Table 2 shows the graphical representation of various ocular conditions presented in different age groups.

Among the age groups, handheld monocular telescopes (44%), and magnifiers (stand, dome, pocket, cutaway, handheld) (34.4%) were most commonly dispensed to children, spectacle magnifier with BI prism (42%) was widely dispensed followed by magnifiers (26%) and handheld telescopes (26%) among young adults. Similarly, spectacle magnifier with BI prism (70%) and magnifiers (16.6%) were most commonly dispensed to middle-aged adults, and spectacle magnifiers with BI prism (80%) were most frequently dispensed to older adults followed by magnifiers (20%). The video magnifiers, however, (<5%) were the least commonly dispensed device among all age groups. Table 3 shows the graphical representation of the distribution of low vision aids dispensed among age groups.

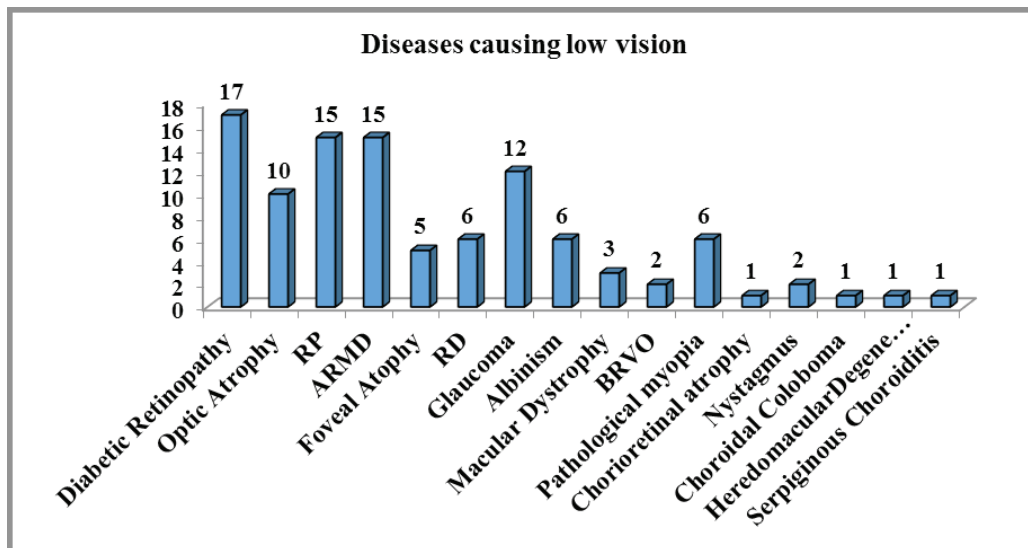


Figure 1: Graph representing ocular diseases causing low vision among patients.

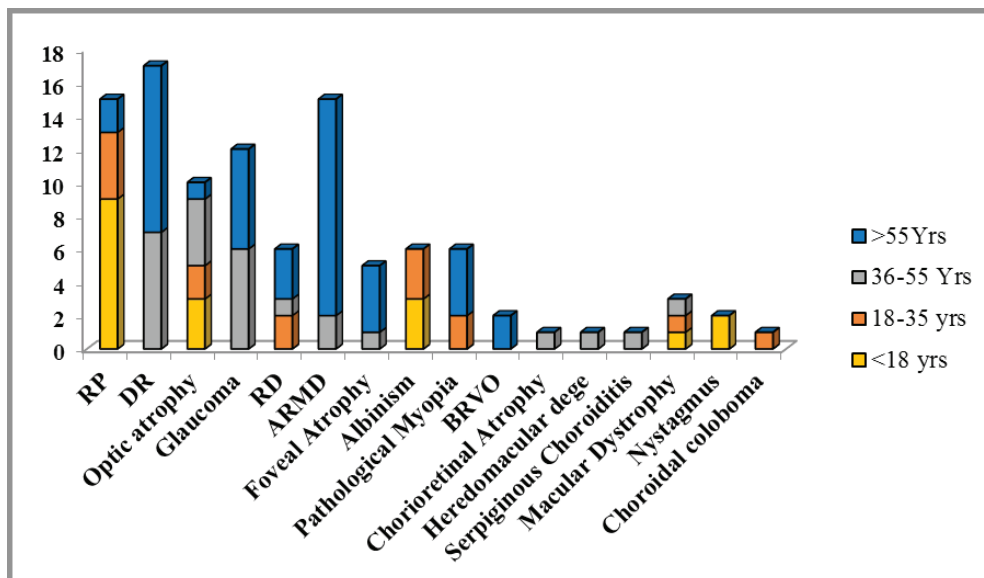


Figure 2: Graph presenting the various ocular conditions presented among different age groups.

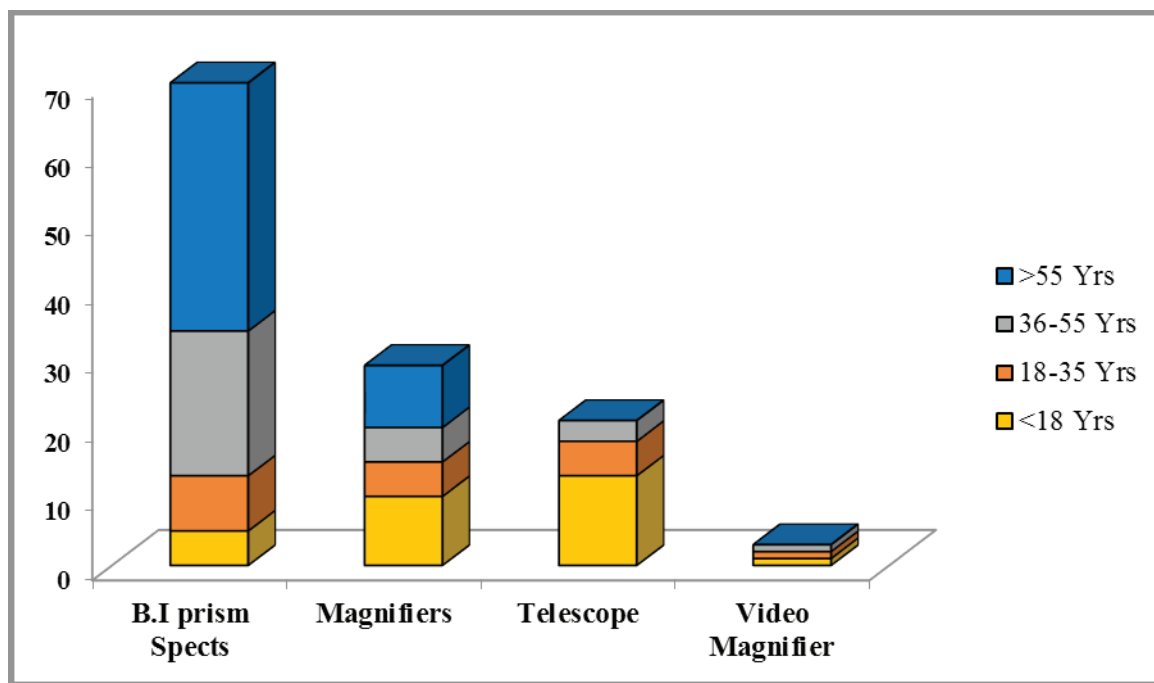


Figure 3: Graph representing the distribution of low vision aids dispensed among different age groups.

Discussion

Low vision has been reported to increase with age, both in and around the country^{10,25-27}, and also around the world^{13,28,29}. In our study population, 43.1% were older adults (>55 years). Likewise, according to a study done by Mohidin N et al., the majority of patients were from the younger age groups (73.8 percent) less than 50 years of age¹¹. Similarly, Olusanya B suggested that the majority (58%) were aged below 50 years¹³, shows that a younger population is the majority.

From the result of our study, the prevalence of Diabetic retinopathy, ARMD, and RP is higher. According to Sathyan S et al¹⁵, diabetic retinopathy (18.1%) was 2nd common cause, likewise, according to Khan SA et al¹⁷, diabetic retinopathy(13%) was 3rd common cause for low vision. In contrast, according to Olusanya et al¹³, only 1% had diabetic retinopathy; this may be due to the majority (58%) of their subjects were aged below 50 years.

Similarly, studies^{13,16,17} has found Retinitis pigmentosa to be the most common cause for low vision which is almost closer to the result of the current study where RP is the another most common cause after DR. The prevalence of ARMD, in this study, is found to be similar in studies done by Kim JH et al¹⁹ and Olusanya

et al¹³. In this research, we found that ARMD was the 2nd most common disease leading to low vision. The prevalence of glaucoma (11.7%) is found to be higher, in resonance with a study done by Vijaya L et al²⁰, wherein glaucoma was the leading cause of irreversible blindness. However, contradicting this statement, in a few studies, the prevalence of glaucoma was found to be very low^{10,16}. Although the prevalence of diseases leading to low vision may vary from one study to another, the first five significant causes leading to low vision are almost similar in all studies, and posterior segment diseases are the leading causes for low vision.

Similar to the results of the current study, Kim et al. concluded that low vision aids for near are dispensed more than the ones for distance¹⁹. In many studies^{10,16}, including the current study, it was seen that the spectacle magnifiers were dispensed frequently when compared to the other magnifiers. However, according to Khanal et al¹⁶, telescopes were the most commonly prescribed devices; this might be due to a higher number of the younger population in the study.

In resonance with the current study, a few other studies^{12,14} have shown that RP, optic atrophy, and albinism are significant causes of low vision among the younger population.

From the maximum of the studies, it was found that spectacle magnifiers were most commonly prescribed, and electronic aids like CCTV were rarely prescribed. In the research done by Khan SA et al¹⁷, CCTV was prescribed to three patients only among the 450 low vision patients. Similarly, in our study also only three video magnifiers are prescribed among the population of 102 low vision patients. This may be due to the expense of the device. Aids like CCTV should be made cheaper so that the more patients can have access to them and be benefitted.

Conclusion

Among the various conditions causing low vision, the prevalence of diabetic retinopathy was seen to be higher with 16.6%, followed by ARMD and RP where the two diseases were found to have an equal prevalence of 14.7%. Among various types of low vision aids dispensed to patients, spectacle magnifiers with BI prism incorporated were most frequently dispensed. It was found that the prevalence of RP was higher among children (<18yrs) and younger adults (18-35yrs) with a prevalence of 50% and 26.6%, respectively. Diabetic retinopathy (28%) was most prevalent among middle-aged adult (36-55yrs) patients, while ARMD (29.5%) had higher prevalence among older adults (>55yrs). Handheld monocular telescopes (44%) were most commonly dispensed to children, spectacle magnifiers with BI prism were often dispensed among young adults (42%), middle-aged adults (70%), and older adults (80%).

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: As the current study is a retrospective one, hospital authority permission has been taken and the current study follows the declaration of tenets of Helsinki.

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Small Neurons of Trigeminal Ganglion - Immunohistochemical Study

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Abstract

The cell bodies of pseudo unipolar neurons of the trigeminal ganglion have been presumed to play a supportive role to neuritis which transmit various sensations like pain from the periphery to the brain stem. However, several studies have recently shown that these neuronal cell bodies could modulate the afferent stimuli by up regulating various ion channels and also by increases the synthesis of neuropeptides like calcium gene-regulated peptides. The small sized neurons were identified by Immunohisto chemical localization in the trigeminal ganglion neurons.

Keywords: Pseudo unipolar neurons, Trigeminalganglion, Immunohistochemistry.

Introduction

Trigeminal ganglion a ganglion on the sensory root of the fifth cranial nerve situated in a cleft with in the dura matter on the anterior surface of the pars petrosa of the temporal bone. The trigeminal ganglion is chiefly formed by cell bodies of pseudounipolar neurons and nerve fibres. The cell bodies which predominantly occupy the peripheral part of the ganglion all surrounded by satellite cells while the nerve fibres are surrounded by Schwann cells.¹ The single neurite arising from each cell body divides into central and peripheral processes which transmits sensations like touch and pain from the head and face to the trigeminal nuclei in the brain stem. Structurally and electro physiologically.²Both these processes show characteristics features of axons. Specifically pain and temperature is carried by thin myelinated and unmyelinated nerve fibres arising from small sized trigeminal neurons.³The aim of the present

study the small sized neurons are mainly concerned with the transmission of pain and temperature from the periphery. These neurons were identified by localization of CGRP an important neuropeptide associated with transmission of pain.

Aim and Objectives

To study the small sized neurones were identified by localization of CGRP.

Materials and Method

Male albino wistar rats (n=6) of weight ranging from 200g was the histomorphometry in the present study. The rats were obtained from experimental animal; facility of Saveetha Medical College. The animal were kept in cages with not more than the three animals in one cage. They were maintained at 12hrs:12hrs light/dark cycles with water and food available ad libitum.

Tissue Collection

Fixation was done using 500ml of 4% formaldehyde in 0.1M phosphate buffered saline, through transcardiac perfusion then dissect the rat brain trigeminal ganglion was identified and removed. Tissues were sectioned (20µm) using cryostat and stained with Cresyl violet.⁴

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Morphometric Analysis of Trigeminal Neurons

The Cresyl violet stained sections were visualized using progRes image capture from senoptikprogRes capture pro 2.7 (Germany) in 20x objective in an e-600 nikon compound light microscope. The diameters of the neurons from energy fifth section were measured using progRes image analysis software. The measured diameters were then divided into three types small sized, medium sized and large sized using SPSS software.⁵

Results

Cresyl violet stained sections of the trigeminal ganglion showed that the majority of the neurons cell bodies were aggregated peripherally. Those situated more centrally were separated by nerve fibres. The cell bodies varied in size. The neurons substance. All the cell bodies were surrounded by satellite cells which could be identified by their smaller polyhedral nuclei. Neurons showing positive immuno staining for CGRP were relatively small in size. (Fig – 1 & 2)

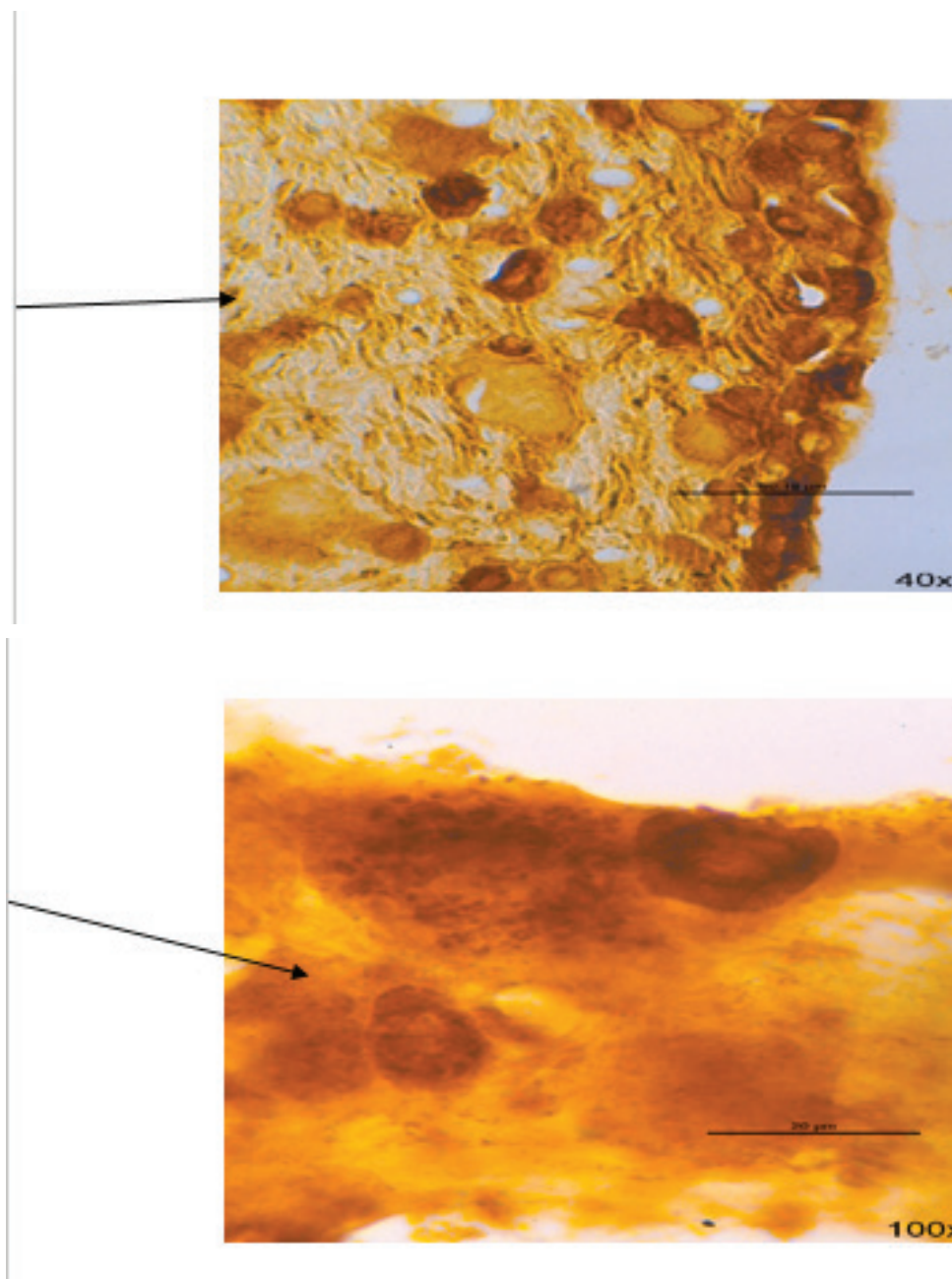


Figure 2 : Small neurons in trigeminal ganglion

Discussion

The present study showed that the cell bodies of the trigeminal ganglion neurons the findings of the present study suggest that the neuronal cell bodies could play a critical role in the pathophysiology changes occurring during disease processes. The small sized neurons which mediate pain and temperature sensation.⁶

The darker colour of the small neurons is due to the fact that the nissl granules are represented by bigger isles composed by the longer cisterus of the cisterus of the rough endoplasmic reticulum and dispersed free ribosome in between them.⁷ Using immunohistochemistry, it is proven that 46% of the small and medium-sized neurons situated in the trigeminal ganglion are immunoreactive and have a darker colour in tested animals after proving the heterogeneity of the cell population in the nervous system, the researches focussed on the secrets of the transmission of nervous processes and the importance of the neurotransmitters in this process studying the vegetative ganglion of an animal state that 20% of the neurons are GABA-ergic.^{8,9} The localization of GABA is in the small afferent neurons which are nociceptive it is thought that GABA is pain transmitter and modulator.¹⁰

The small sized neurons showed higher intensity of staining for the L-, P/Q; N- and T-channels.¹¹ The reason for this is not definitely known: however, Cresyl violet staining had shown extremely dense nissl substance in these neurons.¹² The presence of VSCCS in the nerve fibres indicated that the calcium channels were being possibly transported to the nerve ending. Satellite glial cells were noted to express R-VSCCS. Though the functional significance of this is unknown.^{13,14} Also trigeminal ganglion neuron and the satellite cells have been shown to communicate via gap junction and paracrine signalling through the small sized neurons conveying pain and temperature.^{15,16}

Conclusion

In conclusion, the results of the present study along with that of earlier studies suggest that small sized trigeminal ganglion neuron could take part in the modulation of various sensory stimuli including that of pain and temperature.

Conflict of Interest: No Conflict of Interest

Source of Funding: Self

Ethical Clearance: Obtained from Institutional Animal Ethical Committee

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The Effect of Think-Pair-Share Method of Learning For 1St Year Physiotherapy Students

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Abstract

Background: The traditional method of teaching and role of student compromises of passive note taking and regurgitation of factual information. The recent trends of active learning engage the students in some activity that forces them to reflect upon the ideas and thus use these ideas actively. This allows the students to be mentally and physically active by gathering information, thinking & problem solving. However, Think-Pair-Share Strategy help the learners by giving them time to think, then involving another colleague to look at the problem with different point of view. As a result they may be more willing and less apprehensive in sharing the ideas with a larger group. This study focuses on including Think-Pair-Share method of learning to allow active involvement of students thus helping them in deep understanding of the knowledge.

Material and Methodology: In this experimental study, 100 students of first year physiotherapy were chosen using convenient sampling method with random allocation. The students were taught the viva subjects using Think-Pair-Share method each week. Data was obtained on the basis of viva marks of formative examination. Pre and post assessment viva score was compared for results.

Result: The 'THINK-PAIR-SHARE' method proved to be effective when was implemented in the academic schedule of first year physiotherapy students. It helped the students to improve their learning capacities, thinking skills and sharing abilities. An improvement of 11.6% and 6.1% was found in the preliminary examination scores of exercise therapy and electrotherapy viva subjects respectively. The 'THINK-PAIR-SHARE' strategy was mainly the result of improvement in their examination score.

Conclusion: The 'THINK-PAIR-SHARE' strategy is found to be highly effective in improvement in the examination marks, thinking skills, sharing abilities is concerned.

Keywords: Think-Pair-Share, Active participation, Physiotherapy Students, Exercise Therapy, Electrotherapy, Examination score.

Introduction

The traditional method of teaching and role of student compromises of passive note taking and regurgitation

of factual information.¹ The recent trends of having students engage in some activity that forces them to reflect upon the ideas and how they use these ideas is active learning, which makes the students mentally and physically active by gathering information, thinking & problem solving².

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Kagan (1991) developed Think pair share (TPS) method which provided flexibility to teacher to implement cooperative learning³. Think – Pair – Share Strategy help learners to think by giving them time to

think, then involved with another colleague and look at the different point of view, They may be more willing and less apprehensive about sharing with a larger group, and it gives them time to change their response if needed and reduce the fear of giving the wrong answer and is encouraging them to participate cooperative, mutual learning between individuals, and ensure that the contribution of each student's work³.

TPS is a three-step technique. In the first step, students work individually, in the second step, students take turns to tell or describe with their partner and in the last step students discuss in the class and share what they have learned with the group members. All in all, TPS method incorporates individual work, pair work, and whole class discussions⁴

In the aspect of cooperative learning are interdependence, individual accountability and personal responsibility, face-to-face promotive interaction, use of interpersonal and small group skills, cooperative learning. These five aspects have been shown to allow cooperative learning to be more beneficial than other types of learning, namely competitive and individualistic learning.⁵

Steven C. Reinhart found that in his classroom, think-pair-share helped to improve class discussions more than any other technique he incorporated into his teaching. He noticed that this technique, by first allowing students time to think individually, increased individual accountability and personal responsibility for learning and participation in class compared to starting out in a group, which is one vital aspect of successful cooperative learning. He also noticed that students were more willing to share ideas with the whole class when the responsibility for the response was shared with the partner. He concluded that by using thinkpair-share and other cooperative learning strategies, he gave students the chance to develop deeper understanding of class material, and he was able to better see what his students understood.⁶

Think-Pair-Share Strategy help the learners by giving them time to think, then involving another colleague to look at the problem with different point of view. As a result they may be more willing and less apprehensive in sharing the ideas with a larger group. The Think-Pair-Share method of learning allows active involvement of

students thus helps them in deeper understanding of the knowledge.

Methodology

A total of 100 students of First Year Physiotherapy, willing to participate in the study were chosen using convenient sampling method with random allocation from Krishna college of Physiotherapy, Karad. An ethical clearance certificate for the study was obtained from Institutional Ethical Committee of KIMSDU, Karad. The individuals who fulfilled the inclusion criteria were chosen. However, the students with psychological problems and/or learning disabilities were excluded from the study. A written consent was obtained from the students. Two practical subjects of 1st year Physiotherapy fundamentals of exercise therapy and fundamentals of electrotherapy which included viva as their part of evaluation were considered. A pre-assessment data was obtained on the basis of Terminal examination viva score of each students. Think-Pair-Share method was used as a teaching tool for these subjects for a duration of 3 months. A post-assessment data was obtained on the basis of Preliminary examination viva score. Pre and post assessment viva score was compared for results.

Data Presentation, Interpretation And Analysis

The statistical analysis was done using the paired t test

In the present study the pre assessment scores of practical marks for the subjects of fundamentals of exercise therapy was 43.14 ± 8.71 and post assessment scores was 52.07 ± 6.89 . Statistical analysis using paired t test showed extremely significant (<0.0001) improvement in the practical scores of the students.

In the present study the pre assessment scores of practical marks for the subjects of fundamentals of electrotherapy was 44.37 ± 5.37 and post assessment scores was 49.25 ± 5.51 . Statistical analysis using paired t test showed extremely significant (<0.0001) improvement in the practical scores of the students.

Discussion

Think-pair-share is a student centric teaching strategy, which was first put forth by Frank Lyman. It can be used to help students develop their own ideas,

make a pair with a partner, discuss and share with the others in group. The most important aspect of think-pair-share is that students will develop the ability to consider and appreciate the different viewpoints of their peers.

In this study, 100 students of first year physiotherapy college of KIMSUDU participated. Two practical subjects of 1st year Physiotherapy fundamentals of exercise therapy and fundamentals of electrotherapy which included viva as their part of evaluation were considered. A pre-assessment data was obtained on the basis of Terminal examination viva score of each student. Think-Pair-Share method was used as a teaching tool for these subjects for duration of 3 months. A pre-assessment score on the basis of students' terminal examination marks was obtained, which was held in the month of December. A post-assessment score was obtained on the basis of their Preliminary Examination Score held in the month of April. However, in the course of the study, 2 students out of 100 dropped out and could not participate in the study due to some personal reason.

Our study exhibited an increase in the average score of the students with THINK-PAIR-SHARE method. When the average terminal examination marks of both the subjects were compared with the average preliminary examination marks, there was an improvement seen in the examination marks.

The subject of fundamentals of exercise therapy out of 98 students, 87 students showed an increase in their preliminary examination marks while remaining 11 students showed no increase. In the subject of fundamentals of electrotherapy out of 98 students in total, 79 students showed an increase in their preliminary examination marks while remaining 19 students showed no increase.

The post assessment statistical analysis of both the subjects showed extremely significant (<0.0001) difference after the implementation of the think pair share method. The result support the view of Michael J who in his study has stated that active learning skills are the skills which are student centric. These focus on the student learning and are not based on teacher centric learning.⁷ The additional observations obtained were that students participation in class discussion increased, the interaction and sharing of thoughts with the class improved which correlates with the study of Sampsel

A.⁸ The effect of think pair share method also helped the student to think on the problem, share with the partner and then express it to the class which boost the confidence to express his views in the class.⁹

Some limitations must be taken into consideration while interpreting the results of our study. The present study was conducted at a single institution; therefore generalization of the result may be limited. The sample size of this study was limited; this study could also be carried out with larger sample size.

Conclusion

After analyzing the data, it was established that the 'THINK-PAIR-SHARE' method can be implemented in the academic schedule of first year physiotherapy students in order to improve their thinking abilities. On comparing the scores of terminal examination with preliminary examination of exercise therapy and electrotherapy viva subjects, an improvement in the preliminary examination scored was observed. This improvement was mainly the result of implementation of 'THINK-PAIR-SHARE' strategy in the period after terminal examination.

Thus concluding that the 'THINK-PAIR-SHARE' strategy was found to be highly effective when improvement in the examination marks, learning capacities, thinking skills, sharing abilities is concerned.

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

Ethical Clearance: An ethical clearance certificate was obtained from the Institutional Ethical Committee of Krishna Institute of Medical Sciences Deemed to be University, Karad.

Acknowledgement: The authors would like to express their special gratitude towards all the patients that participated in the study. We would also like to thank our families and institution for their everlasting support which enabled us to continue our research activities.

Source of Funding: Self.

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A Study to Assess the Risk Factor of Diabetic Foot Ulcer among Diabetes Mellitus People Residing at Urban Population in Maraimalainagar, Kancheepuram District

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Abstract

Objectives : The objectives of the study were **1.**To assess the risk factors of Diabetic foot ulcer.**2.**To Find the associations between risk factors and Diabetic foot ulcer.**3.**To stratify the foot ulcer risk population among diabetes mellitus patients. **Method:** A Non-experimental descriptive research design was used in this study.133 clients were selected and explained the purpose of the study and consent was taken. The clients were interviewed by using questionnaires' regarding risk factors of diabetic foot ulcer. Client who were interviewed through the questions were explained by the translator and the answers were marked immediately. The average time spend for every client is 15 minutes. **Result:** The result revealed that out of 133 samples 32% of 43 no. of diabetes mellitus people have inadequate knowledge , 61% of 81 no .of diabetes mellitus people have moderately adequate knowledge , 6.8% of 9 no. of diabetes mellitus people have adequate knowledge.

Keywords : Assess, risk factor, diabetic foot ulcer, diabetes, clients

Introduction

Diabetes Mellitus is a major public health problem, globally and is ever growing as an epidemic in both developed as well as developing nations ^{1,2}More than 170 million people worldwide have diabetes, and this figure is projected to more than double by the year 2030, if the current trend is allowed to continue further ³India is known as the “diabetes capital” of the world with more than 40 million people with diabetes.⁴ Diabetes mellitus is a multifaceted disease and foot ulceration is one of its most common complications. The incidence of foot ulcers among people with diabetes ranges from 8% to 17%.⁵Foot disease is a term typically used to denote

severe foot-related disorders that are likely to result in hospitalization and amputation and most commonly refers to foot wounds and foot infections.^{6,7}

Foot ulceration is a preventable condition, where simple interventions can reduce amputations by up to 70%through programs that could reduce its risk factors ¹⁰Diabetic foot ulcers occur in 15% of patients with diabetes in their life time. ^{8,9,10}Risk factors for foot ulcer include male gender, duration of diabetes more than 10 years, peripheral neuropathy, foot deformity, peripheral vascular disease, smoking, history of prior ulcers or amputation, poor glycemic control, ¹¹

genetic and nutritional factors, diabetic retinopathy and nephropathy. Among them the main factor is peripheral neuropathy.¹²The best approach in dealing with diabetic foot is prevention of ulcer through the identification of individuals at risk, patient education and follow-up. It is possible through routine foot exam, including previous history of the patient, the overall look, neurologic assessment (using 10 grams monofilaments and one of these examinations: The pathogenesis of diabetic foot are

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neuropathy, micro vascular and macro vascular disease. Their process may occur exclusively or they may occur together in varying degrees placing patients at risk for morbidity such as ulceration, gangrene and infection.

Today, India has primary position in the global diabetes epidemiology map as it is the home of nearly 32 million diabetics. The current World Health Organization (WHO) data estimate the combined diabetic population of India and China to be 52.4 million. This number is expected to climb to approximately 121.8 million or one third of the world's prevalence by the year 2030. DM is more prevalent in Asians as compared to Westerners. The top ten countries with the highest prevalence of impaired glucose tolerance in 2003 and 2005 are mainly Asians.¹³

Methodology

The research approach used in this study was quantitative approach with a Non-experimental descriptive cross sectional research design. The study conducted in urban area at Maraimalai nagar. The setting chosen on the basis of feasibility, adequate samples and co-operation extended by the authorities. The sample size consists of 133 diabetic mellitus. Non-probability convenient sampling was used. Reliability of the structured questionnaire to assess the risk factor of diabetic foot ulcer was established by using the test and retest method and 'r' value was $r=0.90$ the score obtained indicated a highly positive correlation hence the tool was considered reliable to be processed with main study.

Criteria For Sample Selection

The inclusion criteria adopted by investigator were Both males & females. Known case of diabetic mellitus

above 2 years residing in selected villages, willing to participate in the study and able to read, write, & speak Tamil. Clients with peripheral vascular diseases because of non diabetic health causes during the time of data collection were excluded from the study.

Ethical Consideration

Formal approval was obtained from the Institutional Review Board and Institutional Ethical Committee of SRMIST, Head of the Department of community medicine, Kattankulathur, Chennai, Tamil Nadu, India. In addition, the participants were informed of their right to withdraw anytime during the study.

Instruments

The Demographic and the Structured Questionnaire was developed by the investigator based on the review of literature, discussion with experts and investigator's personal experience. The tool consists of two sections **Section-A**: Structured questionnaire was used to assess the demographic variables of Diabetic clients. It contains eight items which include age, sex, religion, marital status, education, occupation, type of family, socio economic status. **Section-B**: Diabetes foot screening & Risk stratification form was used to assess the risk factors of diabetic foot ulcer among diabetic clients.

Statistical Analysis

Data obtained was entered into the software and analyzed using descriptive and inferential statistics. Analysis of demographic data was done in terms of frequency and percentage distribution deviation was computed for the knowledge and inferential statistics like chi-square test was used in client relationship between two variables.

Result

Table 1: Frequency and percentage distribution of knowledge level on diabetic foot ulcer among clients with their Selected demographic variables. N=133

Demographic variable		Knowledge Level			Total N (%)	Chi Square Value	P Value	
		Inadequate Knowledge N (%)	Moderately Adequate Knowledge N (%)	Adequate Knowledge N (%)				
Age	31 - 40 Yrs	10(23.3)	15(18.5)	3(33.3)	28(21.1)	5.64 6 df	0.464 NS	
	41 - 50 Yrs	13(30.2)	40(49.4)	3(33.3)	56(42.1)			
	51 - 60 Yrs	15(34.9)	21(25.9)	2(22.2)	38(28.6)			
	> 60 Yrs	5(11.6)	5(6.2)	1(11.2)	11(8.2)			
Sex	Male	18(41.9)	30(37)	2(22.2)	50(37.6)	1.25 2 df	0.535 NS	
	Female	25(58.1)	51(63)	7(77.8)	83(62.4)			
Marital Status	Married	NA						
Education	Uneducated	8(18.6)	14(17.2)	1(11.1)	23(17.3)	4.38 6 df	0.625 NS	
	Middle School	15(34.9)	34(42)	6(66.7)	55(41.4)			
	Higher Secondary School	17(39.5)	25(30.9)	1(11.1)	43(32.2)			
	Graduate	3(7)	8(9.9)	1(11.1)	12(9.1)			
Occupation	Home Maker	6(14)	27(33.3)	5(55.6)	38(28.5)	12.99 6 df	0.043 S	
	Government Employee	1(2.3)	1(1.2)	1(11.1)	3(2.3)			
	Self Employee	21(48.8)	29(35.8)	2(22.2)	52(39.1)			
	Coolie	15(34.9)	24(29.7)	1(11.1)	40(30.1)			
Income	< 3000	0(0)	2(2.5)	0(0)	2(1.5)	12.38 6 df	0.054 NS	
	3000-6000	15(34.9)	24(29.6)	1(11.1)	40(30.1)			
	6001-9000	4(9.3)	26(32.1)	4(44.4)	34(25.5)			
	> 9001	24(55.8)	29(35.8)	4(44.5)	57(43.9)			
Religion	Hindu	30(69.7)	50(61.7)	6(66.7)	86(64.7)	1.00 4 df	0.909 NS	
	Christian	10(23.3)	22(27.2)	2(22.2)	34(25.6)			
	Muslim	3(7)	9(11.1)	1(11.1)	13(9.7)			
Type of Family	Small Family	30(69.7)	40(49.4)	6(66.7)	76(57.1)	10.28 6 df	0.133 NS	
	Joint Family	5(11.6)	20(24.7)	1(11.1)	26(19.5)			
	Extended Family	2(4.7)	15(18.5)	1(11.1)	18(13.5)			
	Nuclear	6(14)	6(11.4)	1(11.1)	13(9.9)			
Medication	1 year	30(69.8)	32(39.5)	6(66.7)	68(51.1)	16.36 6 df	0.012 S	
	2 year	5(11.6)	23(28.4)	2(22.2)	30(22.6)			
	3 year	3(7)	20(24.7)	0(0)	23(17.3)			
	4 year	5(11.6)	6(7.4)	1(11.1)	12(9)			
Type of Diabetes	Type I	32(74.4)	41(50.6)	5(55.6)	78(58.6)	6.59 2 df	0.037 S	
	Type II	11(25.6)	40(49.5)	4(44.4)	55(41.4)			

Discussion

Foot ulcer is a disabling complication and not uncommon among people with diabetes mellitus. The risk factors identified included the need for insulin therapy for uncontrolled blood sugars possibly reflecting a severe form of the condition with poorer glycemic control. The result are supported by study **PiotrNehring et.al (2014)** stated that study included 900 subjects 145 with diabetic foot , 293 with type 2 diabetes without diabetic foot and 462 healthy controls .study proved that patients who are prone to developing diabetic foot are only partially who are at risk of diabetes identification of relationship between diabetic foot and diabetic risk factors in appropriate groups may help clinicians to focus on certain factors in diabetic foot prevention.¹⁴

Prateek Saurabh Shrivastava et.al (2015) stated that A cross-sectional descriptive study for a period of 3 months (October 2014 – December 2014) was conducted among diagnosed Type-2 Diabetes Mellitus patients attending outreach camps. The study subjects were selected based on their suitability with the inclusion and exclusion criteria. The total sample size was 143. In conclusion, even though knowledge with regard to risk factors of type-2 diabetes mellitus was observed to be better among the patients, they were significantly lagging in terms of self-care practices in the same domains. Thus, there is a great need to provide periodic health education to the diagnosed patients so that this knowledge-application gap is narrowed down.¹

Conclusion

The result revealed that out of 133 samples 32% of 43 no. of diabetes mellitus people have inadequate knowledge , 61% of 81 no .of diabetes mellitus people have moderately adequate knowledge , 6.8% of 9 no. of diabetes mellitus people have adequate knowledge.

Financial Support and Sponsorship: Nil

Conflicts of Interest: There are no conflicts of interest

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Epidemiological Study to Assess the Knowledge and Self Care Practices among Type 2 Diabetes Mellitus Patients Residing in Rural Areas of Tamil

Nadu. Journal of Biology and Medicine .2015; June 06, . doi:10.4172/0974-8369.S3-002

The Employment Characteristics, Job Satisfaction and Turnover Intention of Indian Dentists

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Abstract

Background: The paper investigates the causes and consequences of excess supply of fully qualified dentists in the Indian healthcare industry. The soaring unemployment rates further deteriorates the situation. The urbanization of dental practice has increased intensity of the competition in this field. Migration of dentists to middle east and their attempt to change their career path is also discussed.

Objective: To analyse the impact of organizational commitment and work pressure on the job satisfaction the dentists practising in India and to study their turnover intension.

Method: The analysis is done mainly on the current employment characteristics, the job satisfaction and the turnover intention of Indian dentists. The tools used for the study are PLS-SEM.

Conclusion: The results reveal a positive effect of organizational commitment on job satisfaction and that there was a negative effect of work pressure on job satisfaction amongst dentists. It was also observed that, Job satisfaction and level of income satisfaction are the predictors of turnover intention that are statistically significant.

Keywords: Dental Practice, Job Satisfaction, Turnover Intension, Organizational Commitment, Health Care industry.

Introduction

The issues and struggles faced by the dental practitioners often go unnoticed. In the current scenario, India is facing the dilemma of producing an excess of fully qualified dentists thereby increasing the unemployment rate amongst the professionals. The population of India is spread in an uneven manner wherein the majority-almost 70% is concentrated in the rural areas while only 30% reside in the urban areas. The awareness regarding oral health practices is minimum in the rural or inward areas in India, thereby forcing dentists to set up their

clinics or hospitals in the urban areas. This has led to the mushrooming of such establishments in the urban and semi-urban areas creating a gap in the availability of dental treatment in the rural areas¹.

Employment Characteristics

There are numerous issues that have led to the present-day crisis faced by the dental graduates in India. Some of these reasons could be associated to the uneven distribution of dental colleges all over the country. Dentists on the other hand are also ready to do such jobs due to the unavailability of jobs which they are actually qualified for².

More than 70% of the Indian population reside in the rural areas as compared to the 80% of the dentists working in the major cities. Very little healthcare facilities are provided in the rural areas which may be the result of lack of awareness and the minimal oral

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health seeking behaviour amongst the rural people².

A matter of great concern but a relatively new trend is the decision taken by qualified dentists to change their career paths. Most of them look for opportunities abroad like in the western countries or the countries in the middle-east³.

Job Satisfaction

Job satisfaction is all about satisfying one's needs at the work place. There are a few factors that are closely associated with job satisfaction, which include, work substances, age, gender, educational level, environment of work place, location, attitude of colleagues and the income and timing of work⁴.

These difficulties faced by the dentists not only in India but also in different parts of the world like Taiwan, Lithuania etc. brings the researchers to a point where they have to address their job satisfaction and organizational commitments. Organizational commitment refers to a person's psychological attachment towards their organization and also means that whatever the employee does would be in the work place's best interest⁵. Studies also show that job satisfaction may be improved by developing an area of special interest and further training⁶.

With respect to the career or job satisfaction of dental employees practising at Srikakulam, India, the most satisfying aspect was found to be income while the least satisfying factor was staff. The study was proceeded among 66 registered dentists in the area and it inferred that relations with patients, perception of the dental practitioners on income, personal time they had, and staff are the important factors that influence the job satisfaction among dentists⁷. A recommendation was made on how these factors could be used by professional organizations to counsel the pre-doctoral students and make them understand the realities of dental practice⁸.

Turnover Intension

Turnover intention is "the behavioural changes in an employee that may show that they have a tendency to leave their organization which will result to actual employee turnover." To recognize the possibilities of turnovers, the first step is to identify with turnover intention⁹. With reference to the voluntary turnover

model¹⁰ and turnover decision process model¹¹ the two most crucial variables to predict turnover intention are job satisfaction and organizational commitment. Even though over the years, dentistry has been seen as an ideal profession, many researches show that dentists belong to the work group who experience high work pressure and high occupational fatigue¹².

. These situations that result in stress, tends to have a harmful impact both on their personal and professional lives. Dentists are prone for professional burnout, anxiety, and depression. This stress may ultimately lead to having a negative impact on the dentists' personal and professional lives forcing them to leave the organization thereby resulting in turnover¹³.

Studies also show that job satisfaction may be improved by developing an area of special interest and further training¹⁴. A few of them even work without any salary in the name of gaining exposure and experience. These factors have led to majority of the Indian dentists wanting to migrate to different countries like the middle-eastern and western countries and also an alarming proportion of these doctors preferring to even change their career path.

The review of literature goes through various papers addressing the above concerns both in India and other parts of the world. The research methodology gives an overview of the sampling technique used which in this case is a convenience sampling wherein respondents were approached according to their easy accessibility. A well-structured questionnaire is used to collect data in this study and was distributed to the respondent dentists who have worked or are currently working from across the country with a practice history ranging from less than a month to about twenty years. The analysis is done mainly on the current employment characteristics, the job satisfaction and the turnover intention of Indian dentists.

Based upon the literature review and research gap the following objectives were formulated for the study.

Objectives of the Study

1. To explore and understand the current scenario of dental practice in India.
2. To prove the effects of organizational

commitment and work pressure on the job satisfaction the dentists practising in India.

3. To investigate the factors influencing turnover intention in Indian dentists.

Hypotheses:

H1: Organization commitment has a positive effect on Job Satisfaction

H2: Work pressure has a negative effect on Job Satisfaction

Methodology

The study used usable responses from 188 respondents from cross section of private sector, public sector and a mix of both and their clinical practice history ranged from few months to more than twenty years. Non-probability convenience sampling method was used. The respondents were considered from across the country. A well-structured questionnaire is used to collect data in this study and was distributed to the respondent dentists who have worked or are currently working from across the country with a practice history ranging from less than a month to about twenty years. The analysis is done mainly on the current employment characteristics, the job satisfaction and the turnover intention of Indian dentists. The tools used for the study are Microsoft excel, SPSS and PLS-SEM.

Registered Indian dentists and interns aged between 25 and 40 formed sample. However, it does not include highly experienced and established dentists who have been in practice for above thirty years. Majority of the respondents belong to the younger age group who are fresh graduates or have worked for about five years.

Results

The results obtained from the study include an overview of the employment characteristics of Indian dentists in the current scenario wherein the most important findings include more than half of the respondents work for an average of above eight hours for a meagre amount of salary of less than fifteen thousand. The effects of work pressure and organizational commitment on the job satisfaction of the respondent dentists were also analysed where it was seen that there exists a negative effect of work pressure on the job satisfaction and a positive effect

prevails a positive effect of organizational commitment on job satisfaction. The major factors influencing the turnover intention of dentists were also analysed and the results showed that the two main aspects that forces them to leave their job was job satisfaction and level of compensation satisfaction.

The sample consisted of 69% of females and 31% of males. Their ages ranged from less than 25 to greater than 40 with the majority of them falling under the range of 25-30 years (77%). About 68% of the respondents were unmarried and 32% were married. The clinical practice history was also asked for wherein it was seen that about 96% of these dentists had worked for about 5 years.

The mean working hours was found to be about 8 hours. About 43% of the respondents are associate dentists and 25% are doing their post-graduation. 13.3% are currently unemployed though they had worked previously. The rest of the respondents either own a private clinic, rent a dental chair or are doing their internship. Renting a dental chair is the least sought for option amongst the respondents. A large chunk of the respondent dentists, 70.2% to be precise have completed their under-graduation- BDS (Bachelor of Dental Surgery) and only 29.8% have completed their MDS (Master of Dental Surgery)

62% of the respondents use to draw fixed monthly salary. The rest are calculated either on a completely variable (21%) method or partly fixed, partly variable method. (approximately 18%). Majority of the respondents are employed in a private practice setup. With respect to the future intention of dentists, it can be inferred that though most of the dentists think their next job would either be in another hospital or clinic (23.4%) or they would start their own setup (26.1%), intention to emigrate (25%) or even change their profession (14.4%) holds a higher preference than joint practice. While about 53% of the dentists have plans for further study, around 47% feel they would be better off with just general dentistry without any specialization. It is also interesting to note that majority of the respondents (64%) don't have any plans to open up their own clinic in the near future.

Regarding the Expected and actual monthly income of the respondent dentists, it can be inferred that more

than half of the dentists (56.4%) receive a meagre amount of less than Rs 15,000 as their compensation. However, 86% of the dentists expect a compensation of above Rs 15,000. About 60% of the respondents fall into the category wherein they are either “very dissatisfied” or “dissatisfied” with their compensation. Only 11% of the dentists are satisfied with their income. Regarding job opportunities, more than half (52.1%) of the dentists feel that there are not enough opportunities coming their way. Only 15% of the respondents feel that they get other work opportunities.

“Partial least-squares (PLS) technique” was adopted as an approach towards the objective of Structure Equation Modelling (SEM). This was done to analyse the effect of organizational commitment and work

pressure on the job satisfaction of dentists. The software, PLS-SEM provides an estimation and aides in measuring the reliability and validity of the construct measures. Measurement models are the focus in the assessment. It uses multivariate measurement where several variables are used to indirectly measure a concept. By doing so, better accuracy is ensured in the study. The composite reliability score can range from 0 to 1. It is seen that the values are higher than 0.6, that is, $\alpha > 0.6$. this suggests that the model can be considered to be reliable.

All the Average Variance Extracted (AVE) values of the constructs are above the suggested value of 0.5. This exhibits the “convergent validity” of the items of the constructs namely Job satisfaction, Organizational Commitment and Work Pressure.

	JS	OC	WP
JS1	0.839		
JS2	0.796		
JS3	0.777		
JS4	0.845		
JS5	0.736		
OC2		0.786	
OC4		0.832	
WP7			0.724
WP9			0.927

Fornell-Larcker criterion, which is another conservative approach was used to check the discriminant validity. The criterion compares the square root of the

values with the latent variable correlations. It must be noted that the variance value of each construct should be greater than its highest correlation with any other construct, which is met in this case.

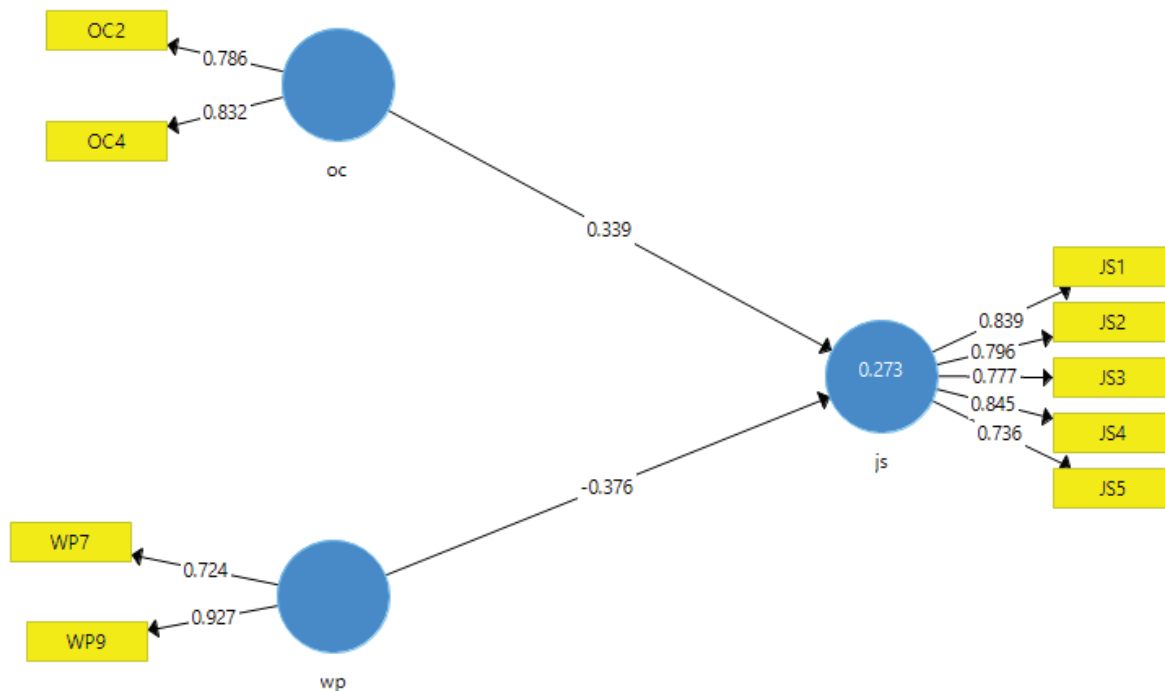


Figure 1: Measurement Model

The measurement model examines the relationship between the latent variables and the observed data. Here, in the above measurement model, the individual reliability of the items was adequate and it is seen that the items with outer loading of above 0.7 is present. The path coefficient value between OC (organizational commitment) and JS (Job Satisfaction) is 0.339 and WP (Work Pressure) and JS (Job Satisfaction) is -0.376. The R² co-efficient of determination is 0.273. If the R² value is less than 0.2, the model has a smaller effect, if it lies between 0.2 and 0.8, the model is said to have a moderate effect, and if it is greater than 0.8, it has a larger effect. The t value should be greater than 1.964. The t value of OC and JS is 4.792 and the t value of WP and JS is 5.564 which clearly indicates that the hypotheses of this study are accepted.

The factors strongly influenced respondent's turnover intension were, personal requirement of life quality (37%), lack of recognition (29%) and comparison of income with peer (29%). These were followed by compensation dissatisfaction (22%) and intention to emigrate (22%). Multiple linear Regression analysis was used to understand the various factors influencing

turnover intention in dentists.

The ANOVA table showed that the model showing the relationship between the dependent variable (turnover intention) and the independent variables, (age, clinical practice history, level of income satisfaction, mean organizational commitment, mean work pressure and mean job satisfaction) can be accepted as it gives a significant result of $p < 0.05$. the adjusted R square value is 0.119. This indicates that, the independent variables in the model account for 11.9% variance in the dependent variable (turnover intention).

From the model summary table, it can be said that the co-relation co-efficient, R is 0.384 and thus, there exists a weak positive relationship and that the model does predict turnover intention but not very precisely. R² denotes the proportion of variance in turnover intention by using six predictors.

The beta-efficient value denotes how many units the probability of leaving the current job increases for a single unit increase in each of the predictor. Here, most of the predictors have a negative value. This indicates that, lesser organizational commitment, job

satisfaction, level of income satisfaction and age, more will be the probability that the respondent would leave the organization. Hence, it can be inferred that, Job satisfaction and satisfaction with the level of income are the predictors of turnover intention.

Discussion

It was observed that job satisfaction and the level of income satisfaction were the two most important factors that influence the dental professionals to stay or leave the job. It was also seen that both work pressure and organizational commitment have an effect on job satisfaction wherein the former has a negative effect and the latter a positive effect. Regarding the employment status, it was found that the practitioners prefer to work as associate dentists compared to a private clinic.

Scope For Further Research

The limitations of the study may be the smaller sample size which failed to confirm the associations in a stronger way. Also, age, gender, other work opportunities etc. which could be used as moderating variables in the study were not made use of.

Ethical Clearance: Not required as anonymity of respondents is preserved.

Conflict of Interest: Nil

Source of Funding: Nil

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Effects of Varied Surface of Circuit Plyometric Training on Speed and Speed Endurance Performance of School Level Basketball Players

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Abstract

Background: Basketball, game played between two teams of five players each on a rectangular court, usually indoors. Each team tries to score by tossing the ball through the opponent's goal, an elevated horizontal hoop and net called a basket.

Purpose: To find out the effects of varied surface of circuit plyometric training on Speed and Speed Endurance of school level basketball players.

Methods: The study was conducted on sixty (N=60) boys Basketball players who will be participating in inter school Basketball tournament in Pudukkottai District during the year 2018- 2019 were randomly selected as subjects. The age of the subjects were ranged from 14 to 16 years. The subjects were divided into four groups of fifteen in each (n=15). Group-I underwent Grass Based Circuit Plyometric Training, Group-II underwent Sand Based Circuit Plyometric Training, and Group-III underwent Aquatic Based Circuit Plyometric Training and group –IV was act as the Control group. The experimental groups underwent their training programme for 12 weeks in addition to the training program designed by the school curriculum. The control group was not underwent any specific training. Speed and Speed Endurance were selected as dependent variables and it was assessed by 50 meter run and 150 meters run test. The data was collected from the four groups prior to and post experimentation on Speed and Speed Endurance was statistically analyzed by using Analysis of Covariance (ANCOVA). Hence, whenever the obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

Results: The results of the study showed there was a significant differences among the selected groups, further the results showed, Aquatic Based Circuit Plyometric Training group was better than other groups on the development of Speed and Speed Endurance.

Key words: Grass Based Circuit Plyometric Training, Sand Based Circuit Plyometric Training, Aquatic Based Circuit Plyometric Training, Speed, Speed Endurance

Introduction

In India, basketball was introduced some 80 years ago by the YMCA at Calcutta. Later the YMCA established in 1920 at Madras played an important role in developing the game. Now a day's basketball is one of the most favourite games in our colleges and schools. Every State in India has formed a State Basketball Association. The Basketball Federation of India was

set up in 1950. It is perhaps the youngest national sport organization in the country. The word training means different things in different fields. In sports the word training is generally understood to be synonym of doing exercise. In a narrow sense training is physical exercise for the improvement of performance. Training involves constructing an exercise programme to develop an athlete for a particular event. This increasing skill and energy capacities are equal consideration².

Circuit training is defined as moving quickly from one exercise station to another and completing a prescribed number of exercises in a given time schedule. It is also a form of body conditioning or resistance training using high-intensity aerobics. The aim is to develop strength and muscular endurance. "An exercise circuit" is a single go of all prescribed exercises in the program in a given time period. This program was developed by R.E. Morgan and G.T. Anderson in 1953 at the University of Leeds in England. Circuit training is the most efficient way to enhance not only the muscular strength, but also the muscular strength endurance, explosive power, cardio respiratory endurance, anaerobic capacity, agility and flexibility. According to Morgan and Anderson the circuit training programs have six to twelve stations focusing on total body conditioning. A complete workout consists of two to three sets of each circuit. Depending on the type of programmes, it may be required to complete a specific number of exercises or for a specified period of time. The break between the sets is usually 15 to 30 seconds. However, any individual can modify the circuit training programme to ensure whether it meets his fitness needs or not³.

The actual term 'Plyometrics' was first coined in 1975 by Fred Wilt, the American Track and Field coach. The elements ply and metric come from Latin roots for "increase" and "measure" respectively, the combination thus means 'measurable increase'⁴.

Plyometric training can take many forms, including jump training for the lower extremities and medicine ball exercises for the upper extremities. Jump training exercises were classified according to the relative demands they placed on the athlete. All the exercises are progressive in nature, with a range of low to high intensity in each type of exercise. The classification of exercises is jumps in place; standing jumps; multiple hops and jumps, bounding, box drills and depth jumps.

The ability to apply force rapidly (reactive force) is the major goal of plyometric training. Plyometrics are used to apply an overload to the muscles with speed – strength as a goal. The speed-strength ability is known as power. Plyometrics should not be considered an end in itself, but as part of an overall program (stretching, running, strength training nutrition, etc). After an athlete has begun a proper strength and conditioning program,

plyometrics are used to develop speed–strength⁵.

Methodology

The study was conducted on sixty (N=60) boys Basketball players who will be participating in inter school Basketball tournament in Pudukkottai District during the year 2018- 2019 were randomly selected as subjects. The age of the subjects were ranged from 14 to 16 years. The subjects were divided into four groups of fifteen in each (n=15). Group-I underwent Grass Based Circuit Plyometric Training (GBCPT), Group-II underwent Sand Based Circuit Plyometric Training(SBCPT), Group-III underwent Aquatic Based Circuit Plyometric Training (ABCPT)and group –IV was act as the Control group. The experimental groups underwent their training programme for 12 weeks in addition to the training program designed by the school curriculum. The control group was not underwent any specific training. Speed and Speed Endurance was selected as dependent variable and it was assessed by 50 meters run and 150 meters run.

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

Results and Discussion

The Analysis of covariance (ANCOVA) on Speed and Speed of Experimental groups and control group have been analyzed and presented in Table -1 & 2.

a) Speed

The results of the Analysis of Covariance on Speed of the pre, post, and adjusted test scores of GBCPT group, SBCPT group, ABCPT group and Control group are presented in Table –1.

Table – 1 : Analysis of Covariance on Speed of Experimental Groups and Control Group

Test	GBCPT group	SBCPT group	ABCPT group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre Test Mean	7.72	7.70	7.73	7.70	Between	0.01	3	0.002	0.12
					Within	1.31	56	0.02	
Post Test Mean	7.16	7.03	6.73	7.69	Between	7.32	3	2.44	68.48*
					Within	2.00	56	0.04	
Adjusted Post Test Mean	7.15	7.04	6.71	7.70	Between	7.61	3	2.53	182.87*
					Within	0.76	55	0.01	

** Significant at 0.05 level of confidence*

(Speed Scores in 1/100th of a Second)

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

The table-1 shows that the pre-test mean values on Speed of GBCPT group, SBCPT group, ABCPT group and Control group are 7.72, 7.70, 7.73 and 7.70 respectively. The obtained 'F' ratio of 0.12 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The post test mean values on Speed of GBCPT group, SBCPT group, ABCPT group and Control group are 7.16, 7.03, 6.73, and 7.69 respectively. The obtained 'F' ratio of 68.48 for post-test scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The adjusted post-test means on Speed of GBCPT group, SBCPT group, ABCPT group and Control group are 7.15, 7.04, 6.71 and 7.70 respectively. The obtained 'F' ratio of 182.87 for adjusted post-test scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Speed.

The results of the study indicate that there are significant differences among the adjusted post test means of GBCPT group, SBCPT group, ABCPT group and Control group in Speed.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post hoc test and the results are presented in Table – 2.

Table – 2 : The Scheffe’s test for the differences between the adjusted post test paired means on Speed

Adjusted Post-test Means				Mean Difference	Confidence Interval
GBCPT group	SBCPT group	ABCPT group	Control Group		
7.15	7.04			0.11	0.12
7.15		6.71		0.43*	0.12
7.15			7.70	0.56*	0.12
	7.04	6.71		0.33*	0.12
	7.04		7.70	0.66*	0.12
		6.71	7.70	0.99*	0.12

** Significant at 0.05 level of confidence*

Table-4.2 shows that the adjusted post test mean differences on Speed between GBCPT group and ABCPT group, GBCPT group and Control group, SBCPT group and ABCPT group, SBCPT group and Control group and ABCPT group and Control group are 0.43, 0.56, 0.33, 0.66 and 0.99 respectively, which are greater than the confidence interval value of 0.12 at 0.05 level of confidence.

Further the table-2 shows that the adjusted post test mean differences on Speed between GBCPT group and SBCPT group is 0.11, which is lesser than the confidence interval value of 0.12 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between GBCPT group and

Aquatic ABCPT group, GBCPT group and Control group, SBCPT group and ABCPT group, SBCPT group and Control group and ABCPT group and Control group on Speed. Further the study showed there was a significant difference between GBCPT group and SBCPT group on Speed.

The above data also reveal that ABCPT group had shown better performance than GBCPT group, SBCPT group and Control group in Speed.

The pre, post and adjusted post mean values of GBCPT group, SBCPT group, ABCPT group and Control group on Speed are graphically represented in the Figure -1.

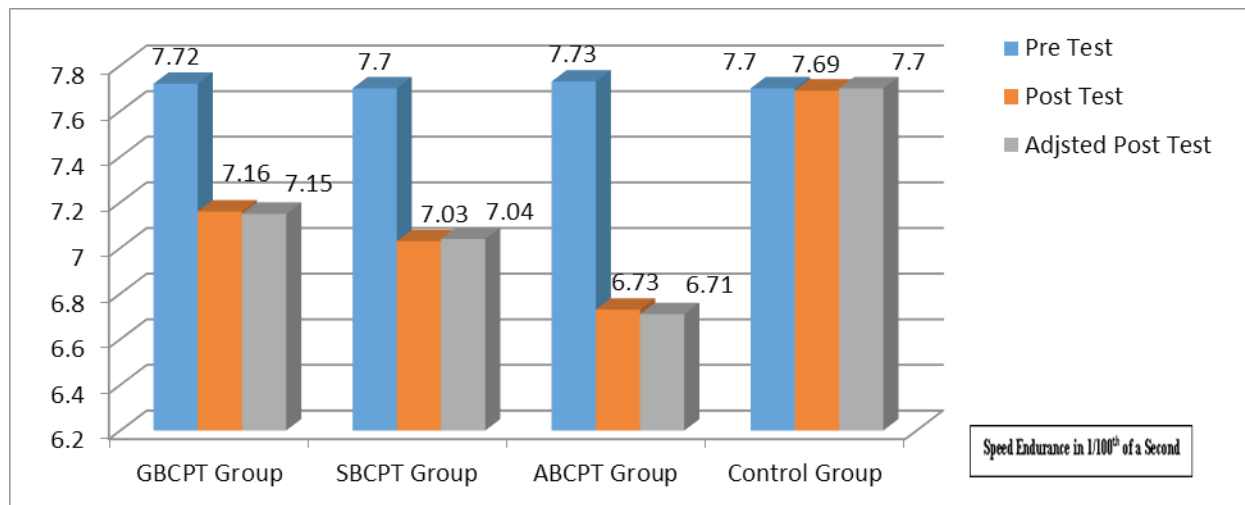


Figure: 1 The Pre, Post and Adjusted Post test Mean GBCPT group, SBCPT group, ABCPT group and Control group on Speed

b) Speed Endurance

The results of the Analysis of Covariance on Speed Endurance of the pre, post, and adjusted test scores of GBCPT group, SBCPT group, ABCPT group and Control group are presented in Table – 3.

Table – 3 : Analysis of Covariance on Speed Endurance of Experimental Groups and Control Group

Test	GBCPT group	SBCPT group	ABCPT group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre Test Mean	27.93	28.93	28.56	28.20	Between	8.40	3	2.80	0.22
					Within	700	56	12.50	
Post Test Mean	36.47	38.00	40.47	28.47	Between	1212.45	3	404.15	26.71*
					Within	847.20	56	15.13	
Adjusted Post Test Mean	36.78	37.64	40.38	28.60	Between	1154.76	3	384.92	39.76*
					Within	532.52	55	9.68	

* *Significant at 0.05 level of confidence*

(Speed Endurance Scores in 1/100th of a Second)

Table value for $df(3, 56)$ at 0.05 level = 2.76
Table value for $df(3, 55)$ at 0.05 level = 2.78

The table-3 shows that the pre-test mean values on Speed Endurance of GBCPT group, SBCPT group, ABCPT group and Control group are 27.93, 28.93, 28.56 and 28.20 respectively. The obtained 'F' ratio of 0.22 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed Endurance.

The post test mean values on Speed Endurance of GBCPT group, SBCPT group, ABCPT group and Control group are 36.47, 38.00, 40.47 and 28.47 respectively. The obtained 'F' ratio of 26.71 for post-test scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at

0.05 level of confidence on Speed Endurance.

The adjusted post-test means on Speed Endurance of ABCPT group, SBCPT group, ABCPT group and Control group are 36.78, 37.64, 40.38 and 28.60 respectively. The obtained 'F' ratio of 39.76 for adjusted post-test scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Speed Endurance.

The results of the study indicate that there are significant differences among the adjusted post test means of GBCPT group, SBCPT group, ABCPT group and Control group in Speed Endurance.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post hoc test and the results are presented in Table – 4.

Table – 4: The Scheffe's test for the differences between the adjusted post test paired means on Speed Endurance

Adjusted Post-test Means				Mean Difference	Confidence Interval
GBCPT group	SBCPT group	ABCPT group	Control Group		
36.78	37.64			0.86	3.28
36.78		40.38		3.60*	3.28
36.78			28.60	8.18*	3.28
	37.64	40.38		2.73*	3.28
	37.64		28.60	9.04*	3.28
		40.38	28.60	11.78*	3.28

** Significant at 0.05 level of confidence*

Table-4 shows that the adjusted post test mean differences on Speed Endurance between GBCPT group and ABCPT group, GBCPT group and Control group, SBCPT group and Control group and ABCPT group and Control group are 3.60, 8.18, 9.04 and 11.78 respectively, which are greater than the confidence interval value of 3.28 at 0.05 level of confidence.

Further the table-4 shows that the adjusted post test mean differences on Speed Endurance between GBCPT group and SBCPT group, SBCPT group and ABCPT group are 0.86 and 2.73, which are lesser than the confidence interval value of 3.28 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between GBCPT group and

ABCPT group, GBCPT group and Control group, SBCPT group and Control group and ABCPT group and Control group on Speed Endurance.

Further the results of the study showed that there was no significant difference between GBCPT group and SBCPT group, SBCPT group and ABCPT group on Speed Endurance.

The above data also reveal that ABCPT group had shown better performance than GBCPT group, SBCPT group and Control group in Speed Endurance.

The pre, post and adjusted post values of GBCPT group, SBCPT group, ABCPT group and Control group on Speed Endurance are graphically represented in the Figure -2.

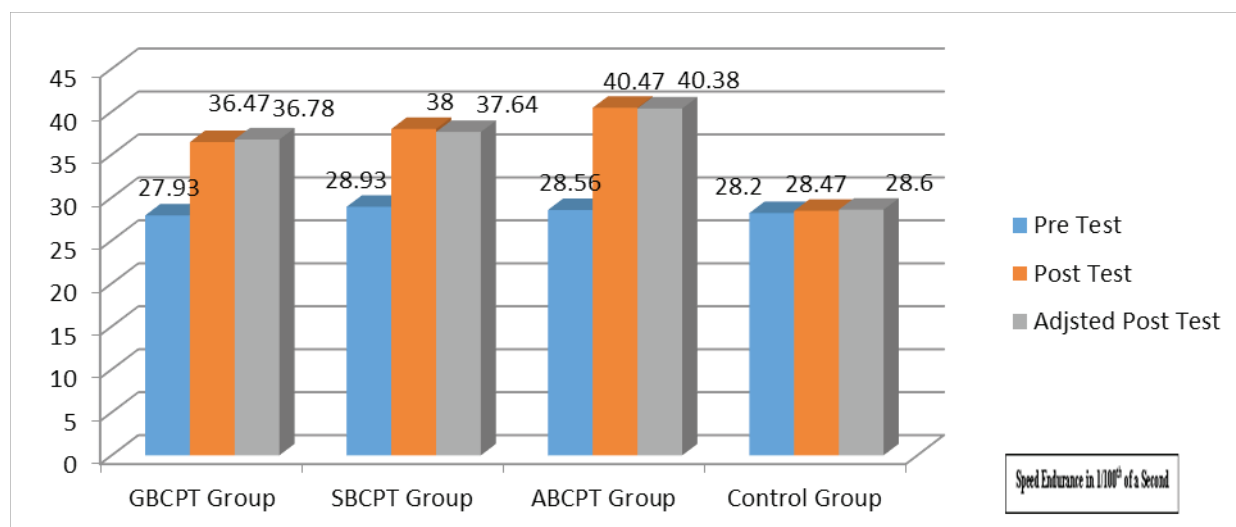


Figure: 2 The Pre, Post and Adjusted test Mean values on GBCPT group, SBCPT group, ABCPT group and Control group

Discussion on Findings

The results of the study indicate that all the Experimental groups namely GBCPT group, SBCPT group and ABCPT group have significantly improved in the selected dependent components namely Speed and Speed Endurance. Further the results of the study showed Control group showed there is no significant improvement.

It is also found that the improvement effected Speed and Speed Endurance by ABCPT group is greater when compared to the effects of GBCPT group and SBCPT group.

Conclusions

The Experimental groups namely, Grass Based Circuit Plyometric Training group, Sand Based Circuit Plyometric Training group and Aquatic Based Circuit Plyometric Training group had significantly improved in Speed and Speed Endurance.

Significant differences in achievement were found among Grass Based Circuit Plyometric Training group, Sand Based Circuit Plyometric Training group, Aquatic Based Circuit Plyometric Training group and Control group on selected criterion variables such as Speed and Speed Endurance

Aquatic Based Circuit Plyometric Training group was found better than Grass Based Circuit Plyometric Training group, Sand Based Circuit Plyometric Training group on the development of Speed and Speed Endurance.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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Quantification of Motor Ability Components in Response to High Intensity Interval Training and Moderate Intensity Continuous Training among College Women Athletes

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Abstract

Background: Motor skills are learned sequences of movements that are combined to produce a smooth, efficient action in order to master a particular task. Arm strength and flexibility are basic essential need for all sports and games. Sports training are the basic form of an athlete's training. It is the preparation systematically organized with the help of exercises, which in fact is a pedagogically organized process of controlling an athlete's development.

Purpose: The purpose of the study was to quantification of motor ability components in response to high-intensity interval training and moderate-intensity continuous training among college women athletes.

Method: Forty five (N=45) women athletes were selected as subjects. They were divided randomly into three groups of fifteen each i.e., (n=15) Group-I underwent high-intensity interval training (HIIT), Group-II underwent moderate-intensity continuous training (MICT) and Group-III acted as control group (CG). The training period was limited to three days per week for twelve weeks. Among the motor ability components arm strength and flexibility were selected as dependent variables. Arm strength was measured through push-ups test and flexibility was assessed through sit & reach test. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variable. The data obtained from the experimental groups and control group before and after the experimental period were statistically analyzed with Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

Results: High-intensity interval training (HIIT) was found to be better than the Moderate-intensity continuous training (MICT) and Control group in developing arm strength and flexibility.

Key words: High-Intensity Interval Training, Moderate-Intensity Continuous Training,

Introduction

Interval training involves activities that are more intermittent. It consists of alternating periods of relatively

intense work and active recovery. It allows performing more work at an intense work load over a long period of time than working continuously. Interval training, as the name implies, is a series of repeated bouts of exercise alternated with periods of relief. Light or mild exercise alternated with periods of relief.²

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Interval training is nothing but, it is such a training which deals with low to high intensity activities where rest period or recovery time is provided between two

repetitions. Generally Interval training consists of increasing intensity workouts (low to high) that are interspersed by periods of rest.³

Exercise intensity is determined by adding four seconds to the average race pace. This is maximal time manipulation of exercise and rest time has a sufficient effect on the intensity of the training stimulus⁴. The intensity can be classified into six intensity zone, like Super maximal (>100), Maximal (90-100), Heavy (80-90), Medium (70-80), Low (50-70) and Very Low (<50).⁵

High-intensity interval training (HIIT) is a form of exercise in which short periods of intense exercise are alternated with less intense recovery periods. It also may be called high-intensity intermittent exercise (HIIE), sprint interval training (SIT), or Tabata (after the professor who studied this type of training in Olympic speed skaters).⁶

Moderate-intensity continuous training methods and high-intensity interval training are typically prescribed to increase motor fitness components. Continuous or long, slow distance training involves steady paced prolonged exercise at either moderate or high aerobic intensity, usually 60-80% Vo₂max. Continuous exercise may increase Vo₂max, capillary density, oxidative enzyme activity and plasma volume in untrained individuals.⁷

Method

Participants:

Forty five (N=45) women athletes studying various arts and science colleges in Coimbatore District, Tamilnadu, India during the year 2019-2019 were selected randomly as subjects. The age, body mass and standing body height of the subjects was ranged between 18 to 21 years, 52 to 58 kilograms, 1.48 to 1.61 meters respectively.

Study Design:

The subjects were divided randomly into three groups of fifteen each i.e., (n=15) Group-I trained high-intensity interval training (HIIT), Group-II trained moderate-intensity continuous training (MICT) and Group-III acted as Control (CG). The subjects performed their training interventions for three days per week for twelve weeks. The control group did not entertain any specific type of activity except the college curriculum.

Data collection:

Arm strength and flexibility were selected as dependent variables and Arm strength was measured through push-ups test⁸ and flexibility was assessed through sit & reach test.⁸ The data on Arm strength and flexibility were collected from the participants before and after the training interventions.

Statistics:

The data collected from the experimental groups and control group on prior and after training interventions on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

Results

Arm Strength

The analysis of covariance on arm strength of the pre, post, and adjusted test scores of HIIT group, MICT group and Control group have been analyzed and presented in table – 1.

Table-1: Showing the analysis of co-variance on the parameter of Arm Strength (Measures in Counts)

Test	HIIT	MICT	CG	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	5.00	5.07	5.13	Between groups	0.13	2	0.07	0.08
				Within groups	34.67	42	0.83	
Post-Test Mean	7.47	6.47	5.20	Between groups	38.71	2	19.36	19.42*
				Within groups	41.87	42	1.00	
Adjusted Post-Test Mean	7.53	6.47	5.14	Between sets	42.73	2	21.36	62.98*
				Within Sets	13.91	41	0.34	

HIIT- High-Intensity Interval Training, MICT- Moderate-Intensity Continuous Training, CG- Control group, df- degree of freedom, * Significant at 0.05 level of confidence, Table value for df (2, 42) at 0.05 level = 3.22, Table value for df(2, 41) at 0.05 level = 3.23

The table-1 shows that the pre-test mean values of arm strength for HIIT, MICT and CG are 5.00, 5.07 and 5.13 respectively. The obtained 'F' ratio of 0.08 for the pre test mean is lesser than the table value of 3.22 for degrees of freedom 2 and 42 required for significance at 0.05 level of confidence on arm strength.

The post test mean values of arm strength for HIIT, MICT and CG are 7.47, 6.47 and 5.20 respectively. The obtained 'F' ratio of 19.42 for the post test mean is greater than the table value of 3.22 for degrees of

freedom 2 and 42 required for significance at 0.05 level of confidence on arm strength.

The adjusted post test mean values of arm strength for HIIT, MICT and CG are 7.53, 6.47 and 5.14 respectively. The obtained 'F' ratio of 62.98 for the adjusted post test mean is greater than the table value of 3.23 for degrees of freedom 2 and 41 required for significance at 0.05 level of confidence on arm strength.

The analysis of the study indicated that there was a significant difference between the adjusted post-test means of HIIT, MICT and CG on arm strength.

Pair wise comparisons of Scheffe's Post Hoc test results are presented in table – 2.

Table-2: Scheffe's test for the Difference between Paired Means on Arm Strength (Measures in Counts)

HIIT	MICT	CG	Mean Difference	Confident Interval Value
7.53	6.47	---	1.06*	0.54
7.53	---	5.14	2.39*	
---	6.47	5.14	1.33*	

*Significant at 0.05 level of confidence.

Table-2 shows that the mean difference values of HIIT and MICT, HIIT and CG, MICT and CG are 1.06, 2.39 and 1.33 respectively, which are greater than the confidence interval value of 0.54 on Arm Strength at 0.05 level of confidence. The results of the study showed that there was a significant difference between HIIT and MICT, HIIT and CG, MICT and CG. The above data

also reveal that HIIT is better than MICT and CG.

Flexibility

The analysis of covariance on flexibility of the pre, post, and adjusted test scores of HIIT group, MICT group and Control group have been analyzed and presented in table –3.

Table-3: Showing the analysis of co-variance on the parameter of Flexibility (Measures in Centimeters)

Test	HIIT	MICT	CG	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	17.80	17.93	18.13	Between groups	0.84	2	0.42	0.71
				Within groups	25.07	42	0.60	
Post-Test Mean	23.40	20.27	18.27	Between groups	200.84	2	100.42	81.96*
				Within groups	51.47	42	1.23	
Adjusted Post-Test Mean	23.49	20.28	18.17	Between sets	208.53	2	104.2	97.77*
				Within Sets	43.72	41	1.07	

HIIT- High-Intensity Interval Training, MICT- Moderate-Intensity Continuous Training, CG- Control group, df- degree of freedom, * Significant at 0.05 level of confidence, Table value for df (2, 42) at 0.05 level = 3.22, Table value for df(2, 41) at 0.05 level = 3.23

The table-3 shows that the pre-test mean values of flexibility for HIIT, MICT and CG are 1780, 17.93 and 18.13 respectively. The obtained ‘F’ ratio of 0.71 for the pre test mean is lesser than the table value of 3.22 for degrees of freedom 2 and 42 required for significance at 0.05 level of confidence on flexibility.

The post test mean values of flexibility for HIIT, MICT and CG are 23.40, 20.27 and 18.27 respectively. The obtained ‘F’ ratio of 81.96 for the post test mean is greater than the table value of 3.22 for degrees of

freedom 2 and 42 required for significance at 0.05 level of confidence on flexibility.

The adjusted post test mean values of flexibility for HIIT, MICT and CG are 23.49, 20.28 and 18.17 respectively. The obtained ‘F’ ratio of 97.77 for the adjusted post test mean is greater than the table value of 3.23 for degrees of freedom 2 and 41 required for significance at 0.05 level of confidence on flexibility.

The analysis of the study indicated that there was a significant difference between the adjusted post-test means of HIIT, MICT and CG on flexibility.

Pair wise comparisons of Scheffe’s Post Hoc test results are presented in table – 4.

Table-4: Scheffe's test for the Difference between Paired Means on Flexibility (Measures in Centimeters)

HIIT	MICT	CG	Mean Difference	Confident Interval Value
23.49	20.28	---	3.21*	0.96
23.49	---	18.17	5.32*	
---	20.28	18.17	2.11*	

*Significant at 0.05 level of confidence.

Table-4 shows that the mean difference values of HIIT and MICT, HIIT and CG, MICT and CG are 3.21, 5.32 and 2.11 respectively, which are greater than the confidence interval value of 0.96 on Flexibility at 0.05 level of confidence. The results of the study showed that there was a significant difference between HIIT and MICT, HIIT and CG, MICT and CG. The above data also reveal that HIIT is better than MICT and CG.

Discussion on Findings

The results of the study indicate that all the Experimental groups namely High-Intensity Interval Training and Moderate-Intensity Continuous Training have significantly improved in the selected dependent components namely arm strength and flexibility. Further the results of the study showed Control group showed there is no significant improvement.

It is also found that the improvement effected arm strength and flexibility by HIIT is greater when compared to the effects of MICT and CG.

Conclusions

Significant differences were found between High-Intensity Interval training, Moderate-Intensity Continuous Training and Control group in the selected criterion variable such as arm strength and flexibility.

The Experimental groups namely, High-Intensity Interval training (HIIT) group, and Moderate-Intensity Continuous Training (MICT) group had significantly improved in arm strength and flexibility.

The High-Intensity Interval training (HIIT) group was found to be better than the Moderate-Intensity Continuous Training (MICT) group and Control group in the performance of arm strength and flexibility.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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A Study on Estimate of Iodine Deficiency Disorders and Iodized Salt Consumption in Sitamarhi District of Bihar

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Abstract

Background-Elimination of iodine deficiency disorder is a very important health and social goal. Iodine deficiency at critical stages during pregnancy and early childhood results in impaired development of brain and subsequent impaired mental function. Objective is To estimate the proportion of households using adequately iodized salt and to estimate the Total Goiter Rate (TGR) in children of age 6-12 years. Material and Method- A cross sectional study was carried out in few administratively selected blocks using simple random sampling. A total of 172 households and 5 schools were visited and 172 children were examined clinically for presence of goiter. Salt samples were collected from every household for iodometric titration. Statistical analysis was done in excel. Result-The respondents were mainly females living in pukka houses with recently built toilet facilities. All of them were using packet salt (retail iodine content-100%, household iodine content -76.9%) but storage of salt was either from the packet itself, Any container without lid and covered container. Presence of goiter after clinical examination was 5.2%. Conclusion-Sitamarhi district needs more awareness about storage and use of iodized salt. It falls under mild endemic for IDD.

Keywords-Goiter, Iodometric titration, Iodine content, Iodized salt, Iodine deficiency disorder

Introduction

Elimination of iodine deficiency disorder is a very important health and social goal. Iodine deficiency at critical stages during pregnancy and early childhood results in impaired development of brain and subsequent impaired mental function¹. Iodine deficiency can lead to a variety of health and developmental consequences known as iodine deficiency disorders (IDDs). Iodine deficiency is a major cause of preventable mental retardation. It is the single largest cause of preventable mental retardation globally.² It is especially damaging during pregnancy and in early childhood. In their most severe forms, IDDs can lead to cretinism, stillbirth and miscarriage; even mild deficiency can cause a significant loss of learning ability. Iodine deficiency may lead to impaired human resource development and subsequently affecting progress of the country.³ Variety of methods exist for correction of iodine deficiency, in practice the most common is universal salt iodization—the addition of potassium iodate to all salt for human and livestock consumption.

There are 3 major components of a sustainable program to eliminate IDD—political support, administrative arrangements and assessment and monitoring systems. Progress in elimination of iodine deficiency disorders (IDD) needs to be tracked and monitored as to ensure sustainability of the progress made towards IDD elimination. Progress can only be demonstrated if it is measured. Sound techniques are needed in order to reliably measure indicators of IDD, and these techniques must be applied using suitable epidemiological methods that take target population, geographical area, and timing of survey factors into account. Realizing the magnitude of the problem the govt of India launched 100 percent centrally assisted National Goiter Control Programme in 1962.⁴ In August 1992 the program was renamed as National Iodine Deficiency Disorder Control Programme (NIDDCP). Goal of this programme is to bring the prevalence of IDD to below 5% and to ensure 100% consumption of adequately iodized salt at the household level (15 ppm).^{5,6} Salt testing lab at PMCH, Patna was

established to improve monitoring at the state level and to improve the coverage and frequency of district level survey. There are many endemic districts even after so many years of salt iodization and frequent surveys and focused interventions are needed to achieve the desired coverage.⁷ Spectrum of IDD having substantial consequences on pregnancy outcomes, neurologic development and impairment of cognitive function makes it an important public health priority.⁸

Goal: To track progress towards sustainable elimination of iodine deficiency disorders in Sitamarhi district.

Objective:

1. To estimate the proportion of households using adequately iodized salt (>15ppm iodine) in Sitamarhi district.
2. To estimate the Total Goitre Rate (TGR) in children of age (6-12 years)
3. To assess the availability of adequately iodized salt (>30 ppm iodine) at their retail shops in the district.

Material and Methods

Study Design: It was a community based cross sectional study conducted from November 2017 to January 2018 in 15 randomly selected villages/clusters of 5 blocks of Sitamarhi district. Asha coordinators and Asha workers of the blocks were contacted for household visits. Household list of those villages was obtained from the block office. List of children of 6-12 years was obtained from the schools. Only those houses were visited where children of that age group were present.

Study Population– It was selected based on inclusion-exclusion criteria.

Inclusion criteria:

1. Children (6-12 years)
2. Households (Head of family or any other responsible person present at time of visit)
3. Retail shop owners.
4. Community and stakeholders.

Exclusion criteria:

1. Those who did not give consent.
2. Those who were ill/incapacitated.

SAMPLING TECHNIQUE & SAMPLE SIZE CALCULATION – Simple Random sampling technique was used to achieve the desired sample size (196). Given the time frame and administrative feasibility this was only applicable. The sample size was calculated using the formula: $N = 4PQ/L^2$ where P=Percentage of household using adequate salt (based on findings of first national iodine and salt intake survey (NISI) 2014-15 at 70%),

$$Q = 1 - P = 0.3, P = 0.7, L = \text{Allowable error} = 10\% \text{ of } P = 0.07$$

$$N = 4 \times P \times Q / L^2 = 172$$

$$L^2$$

Considering 15% non response rate, sample size was calculated to be 196.

Data collection Method–A structured Government of India (GOI) questionnaire was used for obtaining information from the selected households. Training and orientation Workshops were done in the Department of Community Medicine, IGIMS and in Sitamarhi district to orient the field staff and impart practical training in Goiter examination and others details of survey methodology. After the training and orientation workshop, teams comprising of faculty member, senior resident and interns were allotted the villages and selected households. The field survey started immediately after the workshop. The team contacted the ASHA/ASHA coordinator of the village for the house visit and survey. They would conduct the thyroid palpation and assign the goiter grade. They collected salt samples from the households. Informed consent was obtained from the head of the family or the person present at the time of data collection. Sample size was 196 households in the selected blocks but only 172 households participated, and salt samples were collected from the same. Only one child per household was examined. Total 172 Children of 6-12 years were examined in 172 households of 15 villages situated in 5 blocks. Few children of those households were in school so school was also visited

with the help of ASHA and ASHA coordinator to assess the goiter status. Salt packets were purchased from the retail shops. Collected salt samples were sent to PMCH USI lab at department of Community Medicine for testing level of iodine by iodometric titration as the testing facilities are not available at IGIMS, Patna. In the households, the type of salt that is used, type of fuel, type of oil, information on the quantity purchased at a time, price, method of storage of salt, presence of a toilet in the household and other demographic information was also collected.

Method of statistical analysis– Data was entered in excel and analyzed in excel and Epi info (version 7). Awareness, literacy, cooking practices and storage of iodized salt was compared with the presence of clinical goiter and presented as proportion and chi square.

Indicators to be monitored:

A set of indicators have been prescribed by WHO/ UNICEF/ICCIDD to track the progress towards sustainable elimination of IDD as a public health problem. Goiter prevalence should be less than 5% (mildly palpable thyroid) and adequately iodized salt should be 15 ppm or more in > 90% households.

Salt samples were transported immediately to the laboratory.

Laboratory Training and Quality Assurance:

The analysis of iodine in salt was done at the state IDD monitoring lab at PMCH. Only 165 samples could be tested for iodine content. Seven samples could not be tested for various reasons like damage or inadequate quantity.

Results

Socio-demographic profile

Mostly female members were present at the time of survey (88%). Mean age of the respondents was 31 yrs (range-15-76). Literacy of the respondents (more than class 10th) was 40%. Most of the houses were pukka (85%). A toilet facility was present in 90% of

the pukka houses and 50% of the semi pukka houses. Incidentally Sitamarhi was declared the first ODF in Bihar. Only one house was a kachcha house. Mobile was present in 90% of the households. Heads of the family were daily wage workers in 60% of households, Govt employee in 8% of households.

Purchase of salt and cooking practices

Labeled and packet salt was procured from village retail shops. Salt was kept in covered containers by majority of the houses (75%). Few of them kept salt in any bowl or uncovered container (20%). Few used the salt directly from the packet (5%). Most of the households had food cooked in indoor kitchen (90%). Few of the households had outdoor kitchen (10%). Many of them had gas connections too (60%). The food was cooked by mother of the household in 88% of households. In few households (12%) eldest daughter or any other member cooked the food. Only 78% of them used packaged or sealed cooking oil. 18% used loose oil purchased from the retail shops. (Table 1)

Knowledge and information about iodized salt and iodine deficiency disorders

Only 32% of the respondents had heard about iodized salt. Total 20% of them have some knowledge about goitre. Only 2% of them ever heard about mental retardation, birth or developmental defects due to iodine deficiency. Knowledge about iodized salt came from TV, Radio and from ASHA (Table 2).

Proportion of iodized salt

Only 76.9% of households were using adequately iodized salt (Table 3).

Goiter prevalence:

Goiter was found to be present in only 9 out of 172 (5.2 %) children.

Storage of salt samples in uncovered containers was directly associated with less than adequate iodine content in the salt sample and clinical thyroid. (Table 4 & 5)

Table 1: Purchase/storage of salt and cooking practices/Awareness about iodized salt (N=172)

Variables	Frequency (in number)	Percent (%)
1. Place of cooking food		
Indoor kitchen	154	89.5
Outdoor kitchen	18	10.5
2. Type of cooking fuel used		
Gas	103	59.9
Wood/coal/others	69	40.1
3. Hand washing with soap before		
Cooking food		
No	161	93.6
Yes	11	6.4
4. Storage of salt		
Covered container	130	75.58
Bowl or uncovered container	35	20.35
In the packet itself	7	4.07
5. Food cooked by		
Mother	151	87.8
Eldest daughter or other member <15 yr	21	12.2
6. Cooking oil type (packeted,tinned)		
Loose oil from retail	135	82
	30	18

Table 2 .Knowledge and information about iodized salt and iodine deficiency disorders

Variable	Frequency	Percentage
1.Ever heard about iodized salt	55	31.9
2.Ever heard about iodine deficiency disorders	24	13.9
3.Ever heard about goitre due to iodine deficiency	35	20
4.Ever heard about mental retardation, pregnancy complication due to iodine deficiency	3	1.7
5.From which source you came to know about iodized salt TV, Radio, ASHA	(20,15,20)	(11.6,8.7,11.6)

Table 3: Proportion of adequately iodized salt at household and retail level

Total No of household samples	172
No tested	165
No having adequate iodine	127
% of adequately iodized salt	76.9%
Total no of pkts purchased from retail shops	7 types (all had required iodine content)

Table 4: Association of Goitre status with consumption of Iodized salt (N=165)

	No	Use of adequately iodised salt	Use of inadequately iodised salt	P value
Children examined	165	127	38	
Goitre grade 1	8	2	6	<.05
Goitre grade 2	1	0	1	<.05

Table 5: Association of Literacy/storage/cooking practice and salt iodine content (N=165)

Storage practice of salt	Adequately iodized salt	Inadequately iodized salt	P value
Stored in covered jar (125)	120	5	<.05
Stored in non covered jar (40)	7	33	<.05
Total	127	38	
Literacy level of participant	Adequately iodized salt	Inadequately iodized salt	P value
Not went to school (48)	28	20	<.05
≥ class 10th (117)	99	18	<.05
Outdoor/indoor kitchen	Adequately iodized salt	Inadequately iodized salt	P value
Outdoor kitchen(18)	6	12	<.05
Indoor kitchen (147)	121	26	<.05
Age/experience of incharge of household cooking	Adequately iodized salt	Inadequately iodized salt	P value
Younger<15 yr (20)	13	7	<.05
Older (145)	114	31	<.05

Acknowledgement- We acknowledge the efforts and contribution of state and district level National health mission staff ,ASHA workers and our medical officers.

Declaration

Funding-This study is funded by state health society ,IDDCP Cell.

Conflict of interest-none

Abbreviations

IDD-Iodine deficiency disorder

NIDDCP-National Iodine deficiency disorder Control programme

PMCH-Patna Medical College Hospital

IGIMS-Indira Gandhi Institute Of medical Sciences

USI-Universal Salt Iodization

WHO-World Health Organization

UNICEF-United Nations International Children Emergency Fund

ICCIDD-International council for control of Iodine Deficiency Disorders

ASHA-Accredited Social Health Activist

Discussion

Production and availability of adequately iodized salt is essential to achieve the targets of Iodine deficiency disorder control programme. The effort of Government in making good supply chain of iodized salt in the rural areas is commendable as all the salt packets had adequate iodine content as evident from our finding. There has been considerable improvement in usage of household salt iodization that may considerably improve the overall health status wrt IDD.^{9,10} Most of the respondents were not aware of spectrum of iodine deficiency disorders . Most of them were not aware of pregnancy related adverse health outcomes that is critical for achieving health related goals.^{11,12} There was very little attention paid to proper storage of salt in those households where mothers were illiterate or someone younger was in-charge of household cooking .Therefore

other critical components such as proper storage of the salt, awareness levels of the house hold about iodized salt also need attention. There are gaps in the knowledge and storage practices of salt as evident from this study that may result in diminished iodine content of the salt.¹³ The household availability of iodized salt is only 76% which reflects the poor storage practices of salt resulting in diminished iodine content of the salt, which is consistent with the findings of other studies.^{14,15} The less literate had less proportion of adequately iodized salt. At the village level or household level there is a need for awareness activities. Less experienced cook or younger member of family as the in charge of cooking increases the chances of less iodized salt. There is a need to scale up behavior change communication in terms of storage of salt in order to fight adverse effects of less iodized salt on pregnancy and its outcome.¹⁶ Iodine deficiency may make it difficult to attain universal health coverage or slow our progress towards attainment of Sustainable Development Goals.A very huge burden of iodine deficient population belongs to south east Asia including our part of the globe.¹⁷ Frontline workers like ASHA and others may be given training or orientation about IDD spectrum, Iodized salt usage, storage and cooking practices.These frontline workers consequently can educate the community in their respective work areas.Health education may be done at schools,Self help groups and Village health ,sanitation and Nutrition Days may also provide a platform to address this knowledge gap.¹⁸

Ethical Clearance-Taken from Institute Ethics committee.

Source of Funding-Self

Conflict of Interest-Nil

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Assessment of Life Skills Among Students in a High School in Tumkur

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Abstract

India has one-fifth of its population in its adolescence who would become forthcoming productive force. They are at this vital stage of their life and face different scenarios needing for use of their individual skills to manage and cope up with. So this study was undertaken to assess the life skills. **Methodology:** A cross-sectional study using semi-structured questionnaire with the Life skills assessment scale developed by the researchers of Rajiv Gandhi Institute of Youth & Development was conducted. After taking necessary assent from the students, the few demographic data collected was tabulated and analyzed using MS Excel sheet. ANOVA was applied to find the association and parental influence upon the students' life skills. **Results:** The findings revealed that boys slightly more than girls across different classes. Mother's educational status was observed to be on the higher side compared to father's education. Students scored highest on Critical thinking skills and lowest on Coping with Stress skill. Across individual life skills, girls fared significantly better than boys with the skill of coping with stress & emotions; in the self awareness and decision making capacities, the scores showed slight downward trend in acquisition of skill across different years of schooling.

Keywords: Adolescents, life skills, assessment, high school students

Introduction

Adolescents (10-19years) in India comprise 21% of the population and also around a quarter of the world's population with increasing in numbers.⁽¹⁾ It is also a vital stage of growth and development characterized by period of transition from childhood to adulthood and marked by physiological and psychological changes. Their explorative nature leads them to various situations such as multiple opportunities in education, career pathway coupled with peer pressures which are challenging for them. Taking decisions about crucial issues and overcoming these challenges, adolescents require

sufficient mental and physical strength. It is necessary to focus on physiological, emotional needs of adolescents. In this context, there is a need to equip adolescents with life skills so that they can cope with challenges and pressures.⁽²⁾ Investing in adolescent health will yield dividends in terms of delayed marriage, reducing incidence of teenage pregnancy, meeting unmet needs of contraceptive needs, reducing the incidence of sexually transmitted infections (STIs).⁽³⁾

Adolescents are in pursuit of knowledge, seeking various skills and during this endeavor they encounter different situations across various human interfaces. In this effort, they get stressed out and explore ways to relieve their stress and seek pleasure. During such situations, it is very crucial for them to live and stay healthy.⁽⁴⁾ When adolescents are supported and encouraged by caring adults, they thrive in unimaginable ways, becoming resourceful and contributing as members

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of their families and societies.⁽⁵⁾ At this juncture, Life skills are of utmost relevance to equip them to deal life's situations effectively. Life skills are the abilities for adaptive and positive behavior that enable individuals to deal effectively the demands and challenges of everyday life.⁽⁶⁾ It is seen that life skill interventions builds resilience among adolescents.⁽⁷⁾ Adolescents are not fully aware of these abilities and use it only when certain situations demand. There are ten core skill areas which must be harnessed and use it effectively by every adolescent during various interactions. Hence this study was undertaken with the objectives to assess the life skills among the students studying in a high school and also to determine the role of parental influence upon the life skills of the students.

Materials and Method

This is a cross-sectional study was undertaken among the students studying in a secondary school, in Siddharthanagar, 3 kilometers away from the Sri Siddhartha Medical College, Agalakote, Tumakuru. The students pursuing high school education were included in the study. After obtaining informed consent from the Principal, the assent of the students for the study was sought. Questionnaire was administered to students who were present and assented for the study. Those students who were absent at the time of data collection even after 3 visits as well as those who do not give informed consent were excluded from the study. We have taken the Institutional Ethical clearance, Sri Siddhartha Medical College, Tumkur, for this study.

The questionnaire contained two parts. Part 1 comprised of socio-demographic details like name, age, sex, parents' educational status and their occupations, the class in which they were studying. Part 2 contained questions of Life skills assessment scale procured from RajivGandhi National Institute of Youth and Development (RGNIYD), SriPerumbudur, Tamilnadu.⁽⁸⁾ This questionnaire comprises of 100 questions marked on a Likert scale of 1 to 5, 1 being the lowest and 5 being the highest. The scale has a reliability value of Cronbach's alpha of 0.84 and test- retest reliability of 0.91. The questionnaire comprising of both the parts were translated to local language Kannada and checked for consistency by back translation. This questionnaire was piloted among another school students and yielded

satisfactory responses. The questionnaires were administered to the students and care was taken to avoid duplication of the responses from the candidates. Questionnaires were given in phases to avoid the tiredness from the students. Confidentiality of the study subjects was ensured.

The responses obtained would be collected and entered on MS Excel using numerical coding. These codes were analyzed and presented using descriptive statistics like mean, standard deviation. The data from the categorical variables were presented as percentages. The association between the parents' education and occupation to adolescents' various life skills and global scoring across different categories were tested by Analysis of variance (ANOVA). Analysis was done using MS Excel and for testing the association, SPSS version 16 package was used.

Results

In this study, 401 students were interviewed in the school. There were more male than female students (61% vs 38%). The age group of students range from 13-16 yrs and among them 14 and 15 years age group were more in number. In terms of years of study, they were studying in 8th -10th standards. With regard to the parents' educational levels, one-seventh of them were found illiterate. Among the rest of the parents, their educational status ranged from being studied up-to high-school, primary schooling and intermediate & middle level, down the order. Father's educational level ranged from being illiterate, to being studied from high-schooling, primary schooling and intermediate, while mothers' educational status ranged from studied high-school, primary and middle school.

In Table 1, there were more boys in the 14 yrs followed by 15 yrs, 16yrs and 13 yrs whereas the girls were more in 15 yrs age followed by 14 yrs, 13 yrs and 16 yrs.

In Table 2, the life skills were computed and presented. Among the ten life skills, scores were - Critical Thinking, Interpersonal Relationship, Empathy, Self Awareness, Decision-Making, Coping with Emotion, Problem Solving, Effective Communication, Creative Thinking and Coping with Stress, in descending order. The mean scores of the life skills were lowest for the

Coping with Stress to highest for the Critical Thinking skill of the student. Second, third, fourth higher scores were observed for the Interpersonal Relationship, Empathy, and Self-Awareness. Six life skills mean scores were observed to be higher compared to that of the remaining four life skills.

The cumulative scores of all the life skills were drawn up in Table 3. At first, the most of the students scored average, low and high for all the life skills except for the skill of Coping with Stress; the scores for Coping with Stress started with the average and was followed by very high, low and high scores. The numbers of students scoring average for Coping with Stress were lesser than the number of average scorers in the rest of nine skills.

Students' age, gender, current educational status and educational of both the parents was subjected to

ANOVA. Of the association between the different life skills and the students' gender, Coping with Stress ($P=0.002$) and Coping with Emotion ($P<0.01$) was found to be significantly different with mean score of the females more than that in males. This could be explained by the fact that girls' age was slightly more than boys' age.

The parents' education had no significant difference in any of the life skill scores of students. There was no statistical significant difference in the mean scores of nine life skills across different age groups except 'Decision Making' ($P=0.018$). Self Awareness skill score was also found to be significant across different year of schooling among students ($P=0.021$) as well as the Overall cumulative life skill score ($P=0.028$).

Table 1: Distribution of students according to Age and gender:

Sex	Age (N, %)				
	13 yrs	14 yrs	15 yrs	16 yrs	Total
Male	26 (10.6)	111 (45.3)	70(28.6)	38 (15.5)	245 (100)
Female	24 (15.4)	57 (36.5)	60 (38.5)	15 (9.60)	156 (100)
Total	50 (12.5)	168 (41.9)	130 (32.4)	53 (13.2)	401 (100)

Table 2: Distribution of the different life skills scores among the students. (N=401)

Dimensions	Mean	Std. Deviation	Minimum	Maximum
Self-Awareness	37.09	5.56	21	55
Empathy	37.13	4.43	23	50
Effective Communication	29.85	4.20	14	41
Interpersonal Relationship	37.22	4.69	22	50
Creative Thinking	26.84	4.50	14	40
Critical Thinking	37.55	4.70	24	49
Decision Making	36.84	4.26	27	51
Problem Solving	30.27	4.66	17	43
Coping with Emotion	35.77	5.18	20	54
Coping with Stress	23.90	4.94	10	38
Overall Score	332.46	21.43	275	400

Table 3: Distribution of students according to the range of core life skills scores: (N=401)

Dimensions	Very high	High	Average	Low	Very Low
Self-Awareness	7	43	275	67	9
Empathy	3	43	274	76	5
Effective Communication	7	44	259	86	5
Interpersonal Relationship	6	42	263	82	8
Creative Thinking	5	55	273	59	9
Critical Thinking	5	59	261	68	8
Decision Making	9	49	251	86	6
Problem Solving	10	36	276	69	10
Coping with Emotion	7	41	272	74	7
Coping with Stress	121	47	163	61	9
Overall Score	10	52	278	53	8

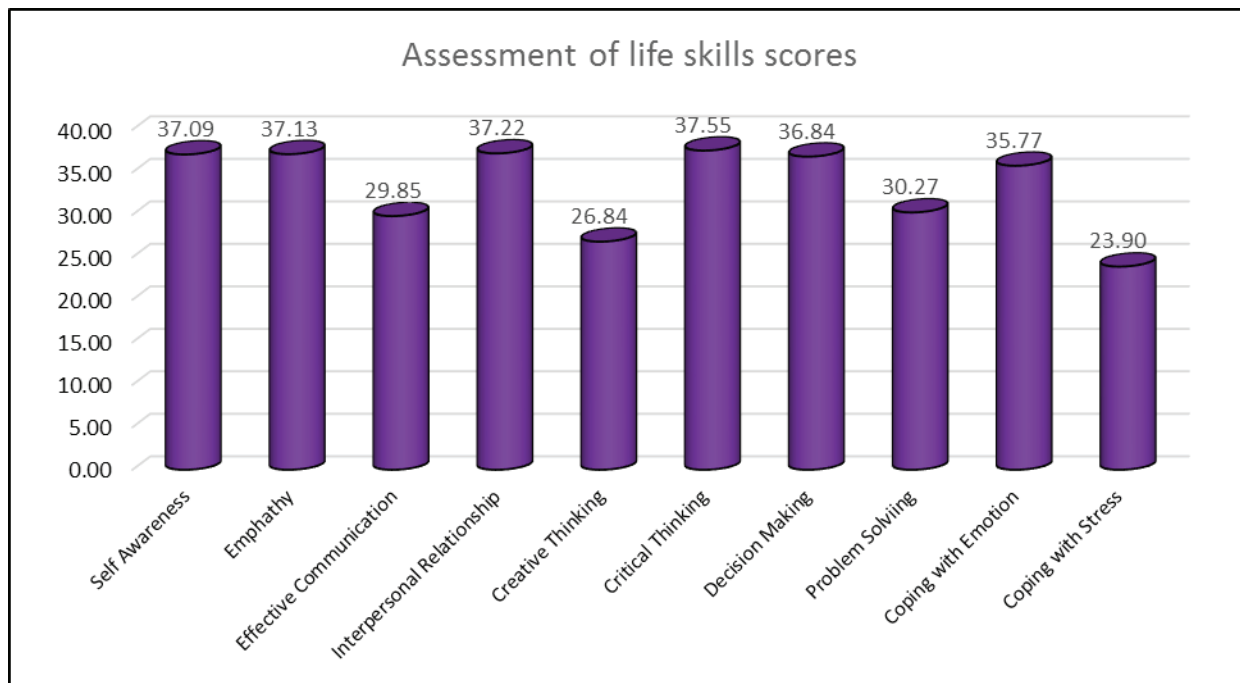


Fig 1: Descriptive assessment of mean scores of the core life skills among students.

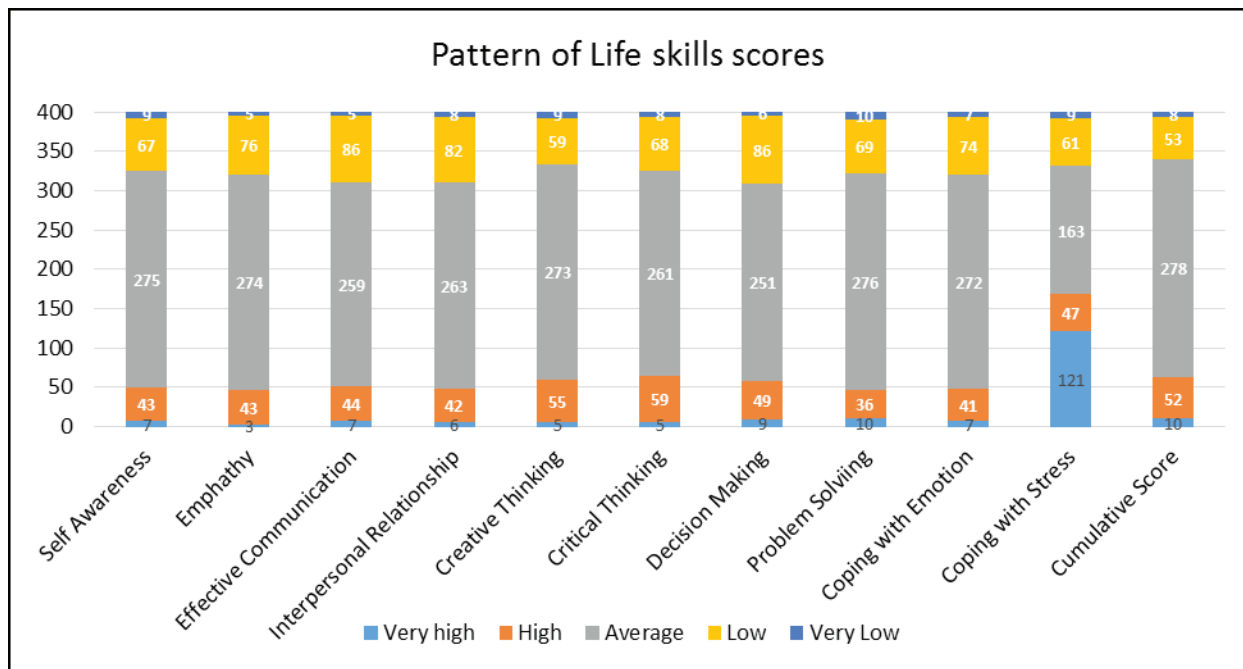


Fig 2: Pattern of life Skills scores of all the students:

Discussion

In this study, 401 students studying across 7th, 8th, 9th and 10th standard, responded to the questions about the base line demographic data and life skills scale. Most of the students were in the age group of 14-15 years and pursuing high school in their 9th & 10th standard. In a Kathmandu study, the proportions of students across all three stages were observed to be in obverse.⁽⁹⁾ In our study, girls of same age group were present in more numbers compared to boys which was similar to the study conducted in Dharwad.⁽¹⁰⁾ While across their different age categories, girls were older than the boys. In our study the parents' educational statuses were primary, middle and high school in that order.

The life skills scores showed that the students had higher Critical Thinking, Interpersonal Relationship, Emphathy and Self-Awareness skills and lower score for Coping with Stress and Emotions. However, good numbers of the students were found to have good Problem Solving skills too. In Kathmandu study, the students possessed high level of Self-Awareness and Emphathy followed by Problem Solving and Coping with Emotion down the order.⁽⁹⁾ Our study observed that the Decision Making and Self Awareness skills were better among the students in 10th standard compared to the 7th & 8th standard students. Similar findings were observed

by study done in Karnataka, India & in Kathmandu wherein the students in higher classes in were found to have better life skills.⁽⁴⁾⁽⁹⁾

In the study, the girls of higher age showed better coping abilities than boys in that group. Anju Mathew and Subha Nanoo in their study upon the adolescent suicide attempters, observed that the coping skills were more used by the non attempters than the attempters, which were similar to the distancing-coping skills observed more among the girls in our study.⁽¹¹⁾ In the Dharwad's intervention of life skill training, it was Coping with Stress that was found to have higher score even before the intervention which reiterates our study findings.⁽¹⁰⁾ The females students had higher skills score with regard to coping skills as compared the males [36.79: 35.11- Coping with Emotions; 25.20:23.07- Coping with Stress] in our study. Age group was observed to have influence upon the Decision making and Self Awareness skill which was more among the girls than boys and also for the decision making skill, too. The overall life skill also significantly varied across different years of schooling.

In Kathmandu study, there was more association between parents' education and connectedness of children to their parents whereas our study did not show any significant association in this aspect. In the same study, it was observed that the increase in the

knowledge level of adolescents about risks was directly proportional to increase in their life skill and our study noted similar findings.⁽⁹⁾ This shows that the life skills are developmental in nature requiring collaborative learning and sharing of the experiences and knowledge with their peers. Vranda and Chandrashekar observed in their study which reiterated the same and further extend that the emotional and social intelligence gets developed in various levels based on their life exposure and need of the hour during their interactions.⁽¹²⁾ In our study, the Self efficacy of the students were significantly higher and it is reiterated by the self concept of the young individuals wherein the “Self” of the individual is the core and strong driving force to change and embrace newer skills for life as observed in Sandhya Khera and DRS Khera.⁽¹³⁾

Adolescence is a transition phase wherein significant challenges are fraught with amongst that age group. The improper guidance lead them to poor choices in their nutrition, peer relations, experimentation and sexual health concerns and is also observed as a time of redefining and developing relationships with their parents, family and peers.⁽¹⁴⁾ Good health for adolescents enables young people to make the most in their lives with their capacities especially when they are fraught with vulnerable situations and unsafe choices and such behaviors have a long term influences leading to chronic health conditions in adulthood.⁽¹⁵⁾ In line with this direction, Government of India has rolled out Adolescent Education Program to support the adolescents.⁽¹⁵⁾⁽¹⁶⁾ NACO also has included in its HIV/AIDS education, life skills as initial strategy to combat the spread of HIV/AIDS among young people.⁽¹⁷⁾

Conclusion

The study brings out that the life skills capacity among adolescents is not uniform with greater ability in Critical Thinking, Interpersonal Relationships, Empathy to lowest being Effective Communication and Coping with Stress. Girls are observed to have better Effective Communication, Coping skills with Emotions and Stress compared to boys. Whereas there was no difference in other life skill acquisition compared to boys. There was differential acquisition of life skills among the adolescents across different stages of their schooling. The life skill capacities of the students have

no association with their parents’ educational status.

Limitations:

This is a cross-sectional study and the findings are limited to adolescents in one school.

Source of Funding: Self

Conflict of Interest: Nil

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Screening For Risk of Eating Disorders: A Study among Students from Selected Colleges In Bengaluru

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Abstract

Background: Eating disorders refer to a group of conditions characterized by abnormal eating habits. It has impact on both physical and socio-emotional health of young people. The study will help in early identification of eating disorders. Addressing eating disorders at the early stage can prevent further physical and psychological complications.

Objectives: To assess the risk of eating disorders among college students using Eating Attitudes Test-26(EAT-26) screening tool.

To determine their behaviors and its association with eating disorders.

Method: A cross sectional study was conducted among students studying in pre-university and degree colleges. The colleges were selected by simple random sampling technique. A total of 500 students participated in the study. Eating Attitudes Test-26(EAT-26) screening tool developed by Garner et al was used to collect the data. The questionnaire was self administered to the students to assess the risk of eating disorders and behavior pattern.

Results: The mean age of the students was 17.60 ± 1.13 years. Risk of disorders was present among 94(18.8%) students. Behavior patterns for development of eating disorders were present among 313(62.1%) students. Among 313 students 73(23.3%) had eating disorder risk. The association between the risk of eating disorders and behavior patterns was found to be statistically significant ($p < 0.05$).

Conclusion: The study concludes that there is an existence of eating disorders among college students and was significantly associated with behavioral domain. This shows the necessity of initiating routine screening and intervention programs to control eating disorders.

Key words: Eating disorders, Risk, Eating Attitudes Test, Body Mass Index

Introduction

Eating disorders are group of conditions characterized by unusual eating habits. They involve

either insufficient or excessive food intake that is detrimental to an individual's physical and emotional health. The most prevailing forms of Eating disorders are Binge eating disorder, bulimia nervosa and anorexia nervosa.¹

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Eating disorder (EDs) is a complex illness that has effect on both physical and socio-emotional health of young people, and contributes to significant morbidity.²

Extreme fear of gaining weight is observed in people with anorexia, which drives them to maintain a body weight far less than normal. Bulimia is characterized

by a pattern of binge eating, accompanied by attempts to get out unwanted calories. People with binge eating disorders often eat an uncontrollable, large amount of food during the binges.¹

Globally many people suffer from this disorder. It is estimated that as many as 24 million individuals in the United States suffer from eating disorders. Nevertheless from past few years it has been introducing in India too. In India the information regarding these disorders is very limited but it is increasing very rapidly day by day due to the effect of media and westernization.³ Screening for eating disorder is an essential step in the process of early identification and intervention.²

Young adults who are college students face many challenges as they navigate this transitional life stage. This period, known as 'emerging adulthood', is characterized by self-focus, identity exploration, and major changes in home life and education/work situations. Emerging adults are at particularly high risk for weight gain and disturbed eating behaviours (Lewis et al., 2000; Hoek, 2006). Disturbed eating behaviours are abnormal practices associated with eating disorders [e.g. restraint, emotional, disinherited, binge, and night eating].⁴

The earlier these disorders are identified and assessed, the greater the chances are for enhanced treatment and better recovery. Therefore, we intend to undertake a descriptive study to assess the risk of eating disorders among college Students.¹ College students were selected as the study group because they are at a receptive and can be motivated to make appropriate healthy modifications and in turn they can influence the community at large.

Aims and Objectives

- To assess the risk of eating disorders among college students using Eating Attitudes Test-26 (EAT-26) screening tool.
- To determine their behaviors and its association with eating disorders.

Materials and Method

A cross-sectional study was conducted among students studying in Pre -university and degree colleges

present in urban field practice area of a tertiary care hospital, Bengaluru.

Inclusion criteria

- The students aged between 16-19 years.

Exclusion criteria

- The students who are absent on the day of data collection.
- Students who do not give consent for the study.

Study duration: 6 months

Sample size:

The sample size was calculated as 489 by considering the study done by Babu S² et al . A total of 500 college students were considered for the study.

Sampling method

The 500 study subjects were chosen by simple random sampling method in 2 stages from 5 pre-university colleges and 4 degree colleges

Methodology

A pilot study was conducted before the actual study, following which necessary changes were incorporated in the questionnaire before the actual study. The data has been excluded from the main study.

Data was collected after obtaining clearance from the ethical committee of the institution. The permissions from the college authorities was obtained before data collection. The participants were explained in detail about the research, and written informed consent was obtained. The participating colleges and students were ensured that a complete confidentiality is maintained. The colleges will be visited three times to track down students absent in previous visits to decrease the non-response rate.

Study tools

The study tool consists of semi structured questionnaire which was self administered to the students. The questionnaire consists of two sections. Section A is a self - report standardized questionnaire. EAT-26 (Eating Attitudes Test-26) developed by Garner et al⁵ to assess

the risk of eating disorders. EAT-26 questionnaire has three criteria for determining the risk of having eating disorder, the first part for socio-economic variables, second comprised of Eating Attitude Test (EAT) to assess the abnormalities in eating behavior and the third part has behavioral questions indicating possible eating disorder symptoms or recent significant weight loss.

EAT test item consists of 26 questions, it is usually answered as always, usually, often, sometimes, rarely or never which was graded as 3,2,1,0,0,0 respectively for first 25 questions and 0,0,0,1,2,3 for the 26th question.

The EAT-26 score ≥ 20 indicate a tendency to develop an eating disorder that would require evaluation by a specialist.

Behavioral questions are in yes or no format. If the answer was yes to one or more questions, it will be considered as the behavioral criteria are met. If one or more of these criteria are met, they are at high risk of having eating disorders and should be evaluated by a specialist.

Those who complete the questionnaires are then examined for various anthropometric parameters: Weight (Kg) and height (meters) will be measured. Body Mass Index (BMI) will be calculated.

Statistical Analysis

The data was compiled in Microsoft (MS) Excel worksheet and analyzed using SPSS (Statistical Package for Social Sciences) software version 20.0. The descriptive statistics- All qualitative variables was presented as frequency and percentages. All quantitative variables were presented as mean and standard deviation. Chi-square tests of significance was applied to analyze the association between eating disorders and demographic variables. p values of less than 0.05 was considered statistically significant.

Results

A total of 500 college students participated in the study. The mean age of the students was 17.60 ± 1.13 years. In the total study participants 241 (48.2%) of them had BMI within normal range where as 95 (19%) of the study participants were under weight and 81 (16.2%) of them were obese. The mean BMI among females was 21.4 ± 3.7 and among males 21.8 ± 3.9 .

Risk of eating disorders was present among 94 (18.8%) students. Behavior patterns for development of eating disorders were present among 313 (62.1%) students. Among 313 students 73 (23.3%) had eating disorder risk. The study participants with abnormal behavior are 2.4 times more likely to develop Eating disorders compared to those with normal behavior.

Table 1: Demographic profile of study participants (N=500)

Variable	Frequency	Percentage (%)
Age(years)		
16	116	23.2
17	110	22.0
18	131	26.2
19	143	28.6
Gender		
Males	215	43.0
Females	285	57.0
Total	500	100

Figure 1: Risk of Eating Disorders among the study participants(N=500)

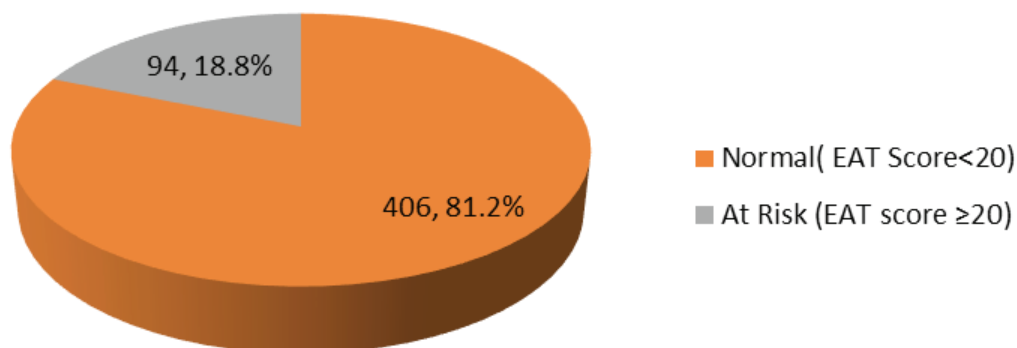


Figure 1: Risk of eating disorders among the study participants (N=500)

Table 2: Association of Body Mass Index and Eating disorders among study participants (N=500)

Factor	Normal EAT Score(<20)	At risk EAT Score(≥20)	Total	Chi-square p value
BMI				
Obese	61(75.3)	20(24.7)	81(100)	χ ² -4.92 p-0.17
Overweight	68(81.9)	15(18.1)	83(100)	
Normal	204(84.6)	37(15.4)	241(100)	
Underweight	73(76.8)	22(23.2)	95(100)	

Table 3 : Gender wise distribution of study participants according to their behaviour patterns for development of Eating disorders. (N=500)

Behaviour patterns	Frequency (%)		Total	Chi-square p value
	Females	Males		
Abnormal	172(55.0)	141(45.0)	313(100)	χ ² -1.432, p-0.231
Normal	113(60.4)	74(39.6)	187(100)	

Table 4: Association between demographic variables and eating disorder (N=500)

Factor	Normal EAT Score (<20)	At risk EAT Score (≥20)	Total	Chi-square p value	Odds Ratio	95% CI
Behavior pattern						
Abnormal	240(76.7)	73(23.3)	313(100)	χ^2 -11.21 p-0.00	2.40	1.42-4.06
Normal	166(88.8)	21(11.2)	187(100)			
Gender						
Female	227(79.6)	58(20.4)	285(100)	χ^2 -1.04 p-0.31	1.27	0.80-2.21
Male	179(83.3)	36(16.7)	215(100)			
Age (years)						
16-17	179(79.2)	47(20.8)	226(100)	χ^2 -1.07 p-0.29	1.26	0.80-1.98
18-19	227(82.8)	47(17.2)	274(100)			

Discussion

EAT questionnaire has been increasingly utilized for screening eating disorders. In the present study the prevalence of eating disorders was 18.8 % (Figure 1). When compared to Indian studies, the results were comparable with the study done by Srinivasan TN et al (14.7%)⁶, Upadhyah AA et al (26.67%).⁷ When compared with Asian countries, the rate of disturbed eating attitude and behaviour, measured by EAT-26 was 10.3% in Korea⁸ and 11.2% in Japan.⁹

The results were similar to the present study in the study done by Anistine D et al where the prevalence was 17%.¹⁰ The prevalence was slightly higher i.e. 24.2% in the study done by Rauof M et al among adolescents in Iran.¹¹

In the present study 19% of study participants had BMI in underweight category and 16.6% in overweight category. A study done by Rawat R et al on prevalence of eating disorders among adolescents³ reported 41.19%, 12.88% in study by Selvan TV et al¹² were in underweight category.

The study done in Karachi has observed significant association between eating disorders and BMI where

28(15.6%) of the participants had eating disorders with BMI < 18.5.¹ The association was statistically significant in studies done by Kumar S et al,¹³ Babu S et al² which differs from the present study where the association was not statistically significant (Table 2).

The number of study participants with eating disorders was more in younger age group and age was significantly associated with eating disorder. Similar results were observed in the study done by Memon et al where 21.1% among 18-21 yrs had eating disorders with no statistical significance.¹

Table 4 shows the significant association between the behavior and eating disorders. The results were similar to the study done in Mangalore city among 1855 adolescents where 21.2% of the participants had behavioral pattern for development of eating disorder ($p < 0.05$).²

The data was collected by self administering the questionnaires so there is a possibility of recall/memory bias or hiding of information which is the limitation of the study. However, higher response rates are one of the strengths of the present study.

Conclusion

Changing lifestyle and social stigma have made physical appearance a priority issue among adolescents. This has made them to take extreme measures to reduce or maintain body weight at the cost of their own health. The study concludes that there is an existence of eating disorders among college students and was significantly associated with behavioral domain. This shows the necessity of initiating routine screening and intervention programs to control eating disorders.

Acknowledgement: We thank all school authorities and the study participants for their cooperation in conducting the study

Ethical Clearance- Taken from Institutional Ethical Committee

Source of Funding- Nil

Conflict of Interest: Nil

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Domiciliary Denture Care- Challenges and the Way Forward

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Abstract

The increasing geriatric population demands a special attention towards the specific healthcare needs of this group. Inequity in oral care arises from financial, behavioural and physical barriers, and remains a challenge for older individuals. A vast majority of older individuals are edentate. The lack of teeth leads to decreased oral function, ability to interact socially and an overall decrease in quality of life. The situation is worse for the frail or elderly who are homebound or under institutional care. Domiciliary denture care can be boon for such individuals. This review attempts at evaluating the need, effects, challenges and possible solutions to improve domiciliary denture care.

Keywords: Geriatric dentistry, barriers, simplified dentures, domiciliary care,

Introduction

Globally the population of those over 65 years is increasing at an average rate of 2.5%. Both the developed, as well as the lesser-developed countries are expected to experience significant shifts in the age distribution of the population by 2050. The increasing lifespan and the gradual increase in this age group mandate special attention from a public health perspective¹.

Aging is an inevitable natural process. The changes associated with this biological phenomenon come with a multitude of social, psychological and medical consequences. As people age they tend to lose teeth to caries or periodontitis^{2,3}.

Though preventive dentistry has made major strides, edentulism continues to be a major public health problem worldwide. The loss of teeth has a multitude of adverse effects on oral and general health. The severity these effects are generally proportional to the degree of oral handicap⁴.

Patients with fewer teeth, tend to consume diets that are poorer in nutritional value and dietary fibre content. These patients frequently prefer softer foods that are most often caloric but poor in nutrients. Hence, the edentulous state is associated with a greater tendency towards obesity and accelerated development of cardiovascular diseases⁵.

Improving the masticatory ability by providing dentures allows these patients to incorporate a larger variety and healthier options of foods. Psychologically, living with missing teeth negatively affects ones quality of life. A large number of edentulous people live with emotional and social disability that directly stems from limitations of function and aesthetics⁶.

Many older people suffer from medical problems and issues with mobility that greatly limits their access to dental care. Dental care is often not readily available to elders in institutionalized care too. Domiciliary denture care will be ideal to reach out to these individuals, providing them acceptable care that will substantially improve their quality of life.

However, prosthodontic procedures for denture fabrication require multiple clinical appointments as well as laboratory processing steps. This along with the large number of materials instruments and equipment required for traditional denture treatment may not make

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the process amenable to a domiciliary setting.

This literature review was undertaken to identify the various challenges to denture care in a domiciliary setting with possible solutions.

The increasing geriatric population:

The growing life expectancy has led to an increasing number of people living over the age of 85. Many of these individuals are frail and functionally impaired, and can no longer live independently or participate in the community. If the impairment is severe enough, the older adult may become home-bound or unable to leave the home without assistive aids or, less commonly, institutionalized in a nursing home. The characteristics of homebound and nursing home residents represent a dramatic contrast from those who are the same age and living in the community⁷. Providing dental care to these individuals poses a challenge.

Need for denture care in the domiciliary setting

There is a large unmet need for denture treatment among this population. Many of them function with old ill fitting dentures, or worse still resign to their edentulous state. Access and availability of dental domiciliary services for disabled older people is poor. Lack of perceived need is often a barrier to care. A vast majority of those more than 90 years old prefer for treatment to be carried out in their own homes

Impact on Oral Health Related Quality of Life

A randomised controlled trial conducted amongst housebound elders needing denture therapy, demonstrated that provision of complete dentures in a domiciliary setting improved oral health related quality of life in housebound participants. Receipt of new dentures was found to improve the quality of life by reducing the prevalence and extent of the impacts⁸.

The improved masticatory ability following complete denture treatment enables patients to choose a larger variety of foods which has a positive impact on their nutrition and general health as well as their overall Quality of Life.

Barriers to Domicillary Denture Care:

Dentist factors

In a study conducted among young dentists below the age of 30 years it was found that there was a great willingness to undertake domiciliary care. The influence of undergraduate training on willingness was significant. Dentists who had attended after-graduation training in the form of a lecture series or a hospital-based training demonstrated improved confidence in domiciliary care. Despite a large majority of these dentists willing to undertake domiciliary care, the study also found that willingness per se may not guarantee that the actual visit will take place⁹.

The reported dentist-related barriers include having to provide treatment in a less than ergonomic way and high workload at work. Lack of domiciliary equipment, such as a portable dental chair, often results in dentists having to provide treatment with bad posturing and poor lighting. This would not only be detrimental to the dentist's health in the long term, but it could also compromise treatment quality and outcome. At the same time, high workload at the clinic had prevented most of the government dentists from undertaking domiciliary visits to the elderly centres. Lack of a radiographic facility was also a barrier⁹.

It has been suggested that, visiting an elderly centre and undertaking a simple treatment on elderly patient under supervision of a dentist could be included in the existing community-based oral health programme for undergraduate dental students^{6,10,11}.

Patient Factors

Most studies reported patient's complex medical conditions and poor attitude towards oral health service as the two most important patient-related barriers towards domiciliary care. There could be several reasons to account for this. Treating an elderly patient with a complex medical condition may lead to a range of complications if it is not carried out properly. It is not uncommon for elderly people especially those who live away from the city to have low demand and expectations from the service. With cognitive decline and various other co-morbidities will result in decreased compliance, poorer adaptation and inability to maintain hygiene of the dentures^{3,10,12}.

Care Centre factors

Other reported barriers were related to elderly

centres. Lack of proper hygiene control, low oral health knowledge among the staff and lack of cooperation were the main barriers reported by the dentists. Among the carers, younger, regular dental attendees who were paid to care were more likely to see benefit in obtaining dental care for their clients. Educating the staff with basic knowledge in oral health and diseases including instructions on how to manage elderly patient's oral hygiene, denture cleanliness, diet and post-treatment oral healthcare^{3,13,14}. This would be highly useful as carers often have limited oral health knowledge and skills which result in their inability to provide adequate oral healthcare for elderly people

Policy makers could play further role by efforts to include elderly people homes and centres as one of the government target groups for oral healthcare.

Financial Factors:

Financial barriers, whether actual or perceived, do limit use of dental services and negatively affect oral health. Consequently, one strategy for improving the oral health of disadvantaged populations is to minimize these barriers by appropriate policies and programs that facilitate access to services consistent with their needs¹⁵. Adults over the age of 65 years have the lowest proportion of dental expenses reimbursed by private dental insurance, and the highest percentage of out-of-pocket dental expenses as compared to all other age groups. Domiciliary care was also poorly remunerated making it less attractive to dental practitioners³.

Simplification of the denture fabrication process:

The traditional technique for fabrication of complete dentures as taught by most dental schools, involves a sequence of clinical and laboratory steps. It has been believed that these individual steps contribute to the success of the treatment and elimination or simplification may affect the quality of the denture.

However, there has been increased scientific literature that provides evidence in support of simplified protocols for denture fabrication. The simplified /abbreviated denture fabrication techniques predominantly eliminate the border molding and secondary impression. A preliminary alginate impression in a stock tray has been found to give acceptable results. Besides this, most of

these techniques involve omission of facebow transfer, balanced occlusion, separate anterior and posterior denture try in and use mean value articulators instead of semi adjustable articulators¹⁶.

Consequentially, these techniques circumvent the need for complex time consuming procedures with fewer clinical and laboratory steps. The decreased laboratory steps as well as use of more economical materials like alginate for the impression leads to a decrease in the total cost of fabrication. This would be a great advantage to many of the elderly who have constrained finances and limited insurance cover^{17,18}.

Dentures fabricated by simplified techniques have been found to be comparable to those fabricated by the traditional method. The added advantage of being more cost efficient and less time consuming makes them ideal for domiciliary settings¹⁸.

Denture care: The elderly who wear dentures should be taught proper home care of both dentures and tissues on which they rest as well as the need for continued professional care. The tissues can be prevented from harm by avoiding wearing the denture constantly. An instruction for the removal of the denture while retiring for the night is essential. The cleaning and massaging of the tissues under a denture at least once a day increases circulation and thus enhances the health of these tissues.

Elderly persons who wear full or partial denture must be taught to clean these appliances in a way that is effective. Immersion of denture in cleansers is the recommended method that ensures safety against damage of the denture material. The patient should be instructed always to brush and rinse the denture thoroughly before and after soaking in immersion cleans. Caregivers should also be trained adequately so that they may assist patients who are incapable of maintaining denture hygiene³.

Conclusion

Policy makers could play further role by efforts to include elderly people homes and centres as one of the government target groups for oral healthcare. Recruiting people with empathy and selflessness for admission to dental and dental hygiene programs could help to achieve more holistic and equitable professional oral health care for the rapidly aging population. Domiciliary denture

treatment requires skills that extend beyond clinical dentistry. Training in the understanding, planning and delivery of all aspects of domiciliary services should be provided to all members of the dental team who are likely to be involved.

Ethical Clearance: The review is based on secondary data, hence does not require ethical clearance.

Source of Funding: Self funded

Conflict of Interest: Nil

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Prevalance of Prediabetes among Adults and Evaluation of Indian Diabetes Risk Score (IDRS Score) in a Tertiary Care Hospital

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Abstract

Background: Status of diabetes mellitus has changed in the recent years and now is one of the major cause for morbidity in young adults. Prediabetes is an intermediate stage of impaired glucose tolerance in the natural history of diabetes mellitus. **Objectives:** The present study aims to determine the prevalence of prediabetes in adults (age group 18-35 years) and to calculate the detailed risk score by using IDRS and correlate it with diabetic status. **Methods** Fasting plasma glucose was estimated by hexokinase method. **Results:** Prevalence of prediabetes was 2%. Based on IDRS scoring 40% of the subjects had low risk, 58 % of the subjects had moderate risk and 2% of the subjects had high risk of developing diabetes mellitus. **Interpretation and conclusion:** Screening for diabetes mellitus should be considered for individuals above 18 years for the presence of risk factors including family history of DM, physical activity and obesity using IDRS.

Key words: Diabetes mellitus, Fasting plasma glucose , IDRS score, Physical activity Prediabetes

Introduction

Diabetes mellitus (DM) is a metabolic disorder associated with chronic hyperglycemia due to absolute or relative decrease in insulin secretion and / or insulin action characterised by disturbances of lipid, carbohydrate and protein metabolism. Diabetes mellitus is one of the major health problem affecting populations worldwide. India is known as the “diabetes capital of the world”^[1] Status of diabetes mellitus has changed since the past 30 years from being a disorder of the elderly to one of the major cause for morbidity affecting youth and middle aged person^[2]. Prediabetes is a high risk

intermediate stage in the natural history of diabetes ^[3]. The term prediabetic is an intermediate stage used to describe a person with impaired blood glucose tolerance levels of fasting between 100 and 126 mg/dl of blood or whose 2-hour postprandial blood glucose is 140-200 mg/dl^[4]. Prediabetics are likely to progress to diabetes within ten years or less, if no timely intervention or treatment is done ^[5]. Prediabetic stage represents the tip of the iceberg. Early diagnosis and interventions of prediabetes can decrease the risk for occurrence of type 2 DM and its associated complications ^[6]. Sedentary lifestyle and changing food habits have resulted in an increasingly high prevalence of overweight and obesity since early ages which may increase the risk of developing prediabetes and diabetes mellitus ^[7]. Screening methods are to be employed at the earliest to identify individuals who are at high risk for development of diabetes mellitus. A simple low cost diabetic risk score (IDRS) has been developed by Mohan etal , from their Chennai Rural Epidemiology study (CURES) cohort.^[8] This study is done with the aim of determining

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the prevalence of prediabetes in adults (age group 18-35 years) and to calculate the detailed risk score by using IDRS and correlate it with diabetic status.

Objectives

- To study the prevalence of prediabetes among adults
- Evaluation of Indian Diabetic risk scores among adult prediabetics
- To correlate pre diabetic status with risk factor score of these patients

Methodology

Materials and methods

Study Design: Cross sectional study

Study population: Healthy subjects aged 18-35 years

Sample size: 100

Inclusion Criteria:

- Subjects in the age group between 18-35 years

Exclusion Criteria:

- Subjects not willing to participate

Selection of subjects

The informed consent will be obtained from the selected subjects and who are willing to participate in the study

Ethical considerations

Study was approved by the institutional ethical committee

Method of biochemical analysis

Glucose estimation: Enzymatic reference method with hexokinase

Prediabetes is defined as Fasting plasma glucose level of 100-125 mg/dl after 8-12 hours of fasting (American diabetic association)

IDRS SCORE derived from CURES

Risk Criteria	Details	Scores
Age (years)	< 35	0
Abdominal Obesity	Waist < 80cm (female) < 90cm (male)	0
	Waist < 80 – 89cm(female) < 90-99cms(male)	10
	Waist ≥ 90cm (female)>_100cm(male)	20
Physical activity	Vigorous exercise or strenuous work	0
	Moderate exercise work/home	10
	Mild exercise work/home	20
	No exercise and sedentary work /home	30
Family history	No family history	0
	One parent	10
	Either parent	20
Score	Maximum	70
	Minimum	0

IDRS score was assessed by three simple questions and a waist measurement in all the study subjects. The students were given scores according to family history of type 2 DM, and physical activity (Sedentary, mild, moderate, vigorous exercise, or strenuous work).

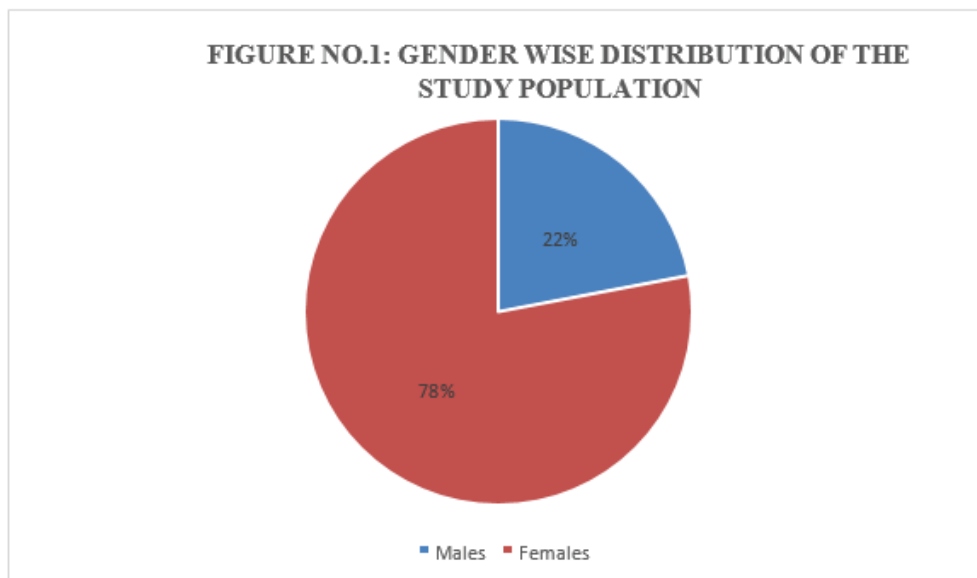
Measurement of waist circumference (WC) (indicates both central as well as general obesity) was

done by using a measuring tape. The WC was taken at the midpoint between the iliac crest and the lower border of the ribs after a normal expiration⁽⁹⁾

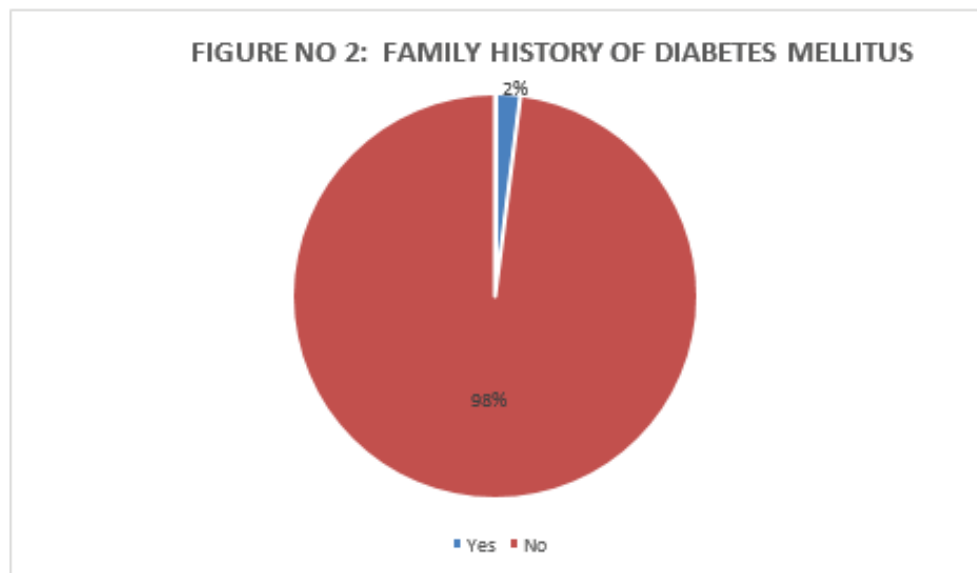
IDRS is a safe, simple and inexpensive tool which consists of four parameters i.e. exercise status, family history of type 2 DM, age, and obesity. The validated IDRS is useful as a tool to screen diabetes risk and to detect undiagnosed type 2 DM.

Results

This study was conducted among healthy individuals in the age group of 18- 35 years were males. (Figure No.1)



Total of 100 subjects were included in the study out of which 22 subjects were females and 78 were males. (Figure No.1)



Family history of diabetes mellitus was present among 2 subjects.

Table No.1: IDRS SCORE OF THE STUDY SUBJECTS

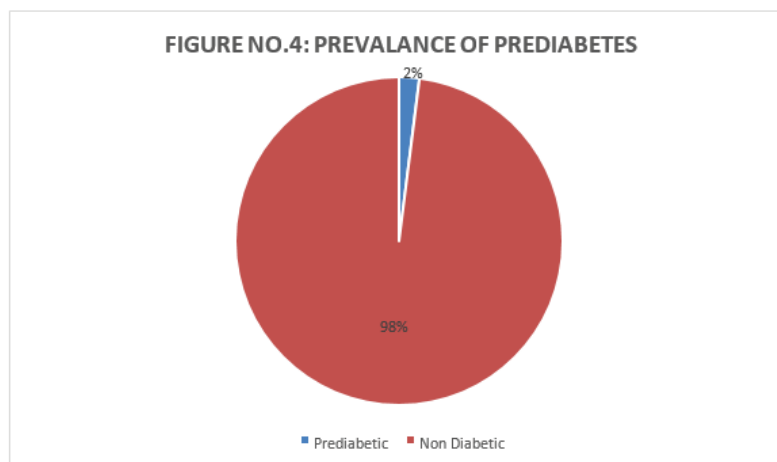
GENDER			
IDRS Group		Frequency	Percent
Low risk < 30	Male	10	25.0
	Female	30	75.0
	Total	40	100.0
Moderate risk 30-50	Male	11	19.0
	Female	47	81.0
	Total	58	100.0
High risk >50	Male	1	50.0
	Female	1	50.0
	Total	2	100.0

TABLE NO.2: DIABETIC STATUS AT DIFFERENT IDRS RISK GROUP

Diabetes Status			
IDRS group		Frequency	Percent
Low risk < 30	non diabetic	40	100.0
Moderate risk 30-50	non diabetic	58	96.6
	Total	58	100.0
High risk >50	Pre diabetic	2	100.0

TABLE NO. 3: MEAN FASTING BLOOD SUGAR BETWEEN IDRS RISK GROUPS

Parameter	Low risk (n=40)	Moderate risk (n=58)	High risk (n=2)
FBS	84.78 ± 5.60	90.99 ± 5.31	98.75 ± 1.77



Prevalence rate = Total number of pre-diabetics / Total number of subjects = 2/100 = 0.02 or 2%

Discussion

In the present study of 100 participants the prevalence of prediabetes is 2%. Based on IDRS scoring 40% of the subjects had low risk, 58 % of the subjects had moderate risk and 2% of the subjects had high risk of developing diabetes mellitus. Study by Arathi D et al on 200 medical students showed the prevalence of prediabetes in 24.5%. Based on IDRS scoring low risk was present in 82.5% of the study group, moderate risk in 16.5% and 1% of the students had high risk of developing diabetes mellitus⁽¹⁰⁾Prevalence of prediabetes and diabetes mellitus is low in our study compared to other studies. Smaller sample size is the major limitation of our study.

In our study prediabetics had a strong family history of diabetes mellitus. Prediabetics were more obese and had higher abdominal circumference than normoglycaemic subjects. Subjects with moderate risk based on the IDRS score, had sedentary lifestyle.

Even though metabolic changes in prediabetes are triggered mainly by important interactions of genetic and environmental factors, the high absolute risk associated with obesity highlights the importance of lifestyle interventions⁽¹¹⁾. In our study lack of physical activity is a major concern which increases the future risk of developing type 2 DM as without exercise the younger individuals may get more obesity in future. Individuals with family history of diabetes mellitus should be regularly screened for prediabetes and diabetes mellitus. IDRS is a useful tool to predict the future risk of diabetes

mellitus.

Conclusion

Screening should be considered for individuals above 18 years for the presence of risk factors including family history of DM, physical activity and obesity .IDRS is a less expensive tool which helps in screening high risk people for further investigations. IDRS can help both in predicting and preventing the risk of development of diabetes mellitus.

Acknowledgement: Indian council of medical research (ICMR). This study is a part of STS 2017 of ICMR(2017-00921)

Nitte (deemed to be university) for providing an opportunity to conduct this work

No conflicts of Interest

Funding agency: Nitte (Deemed to be University)

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Efficacy of Pedometry and Pulmonary Rehabilitation on COPD Rehabilitative Patients –Experimental Study

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Abstract

Aim: The aim is to determine the effectiveness of Pedometry along with Conventional Physiotherapy for COPD patients.

Procedure: Total of 30 subjects were selected using convenient sampling technique based on the inclusion and exclusion criteria. The study will be explained to the patients and written consent will be obtained from the subjects. Subjects will be allocated in two groups using convenient method of sampling.

Group A (Control group) (n=15) will be treated with Diaphragmatic breathing exercise and thoracic mobility exercises. (Pulmonary rehabilitation)

Group B (Experimental group) (n=15) will be treated with Conventional Physiotherapy followed by Pedometry.

The study was done in Saveetha Medical College and hospital in the Physiotherapy In-patient & Out-patient department, 30 subjects of both male and female will be selected on basis of inclusion and exclusion criteria using convenient sampling method

Results: Statistical analysis was carried out on basis of comparison between the two groups results obtained using the outcome measure and calculated using unpaired t test and t value of > 0.001 was considered to be statistically significant.

Conclusion: This study demonstrates that Pedometry along with Conventional Physiotherapy can have a dramatic impact on patients with COPD, increasing physical activity level and enhancing quality of life

Keywords: *Pedometer; Pulmonary rehabilitation; Functional status questionnaire; Six minute walk test; Modified Borg's dyspnea scale*

Introduction

Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that causes obstructed airflow from the lungs. It's caused by long-term exposure to irritating gases or particulate matter, most often from cigarette smoke. People with COPD are at increased risk of developing heart disease, lung cancer and a variety of other conditions. *Emphysema* and *chronic bronchitis* are the two most common conditions that contribute to COPD.

Chronic bronchitis is inflammation of the lining of the bronchial tubes, which carry air to and from the

air sacs (alveoli) of the lungs. It's characterized by daily cough and mucus (sputum) production.

Emphysema is a condition in which the alveoli at the end of the smallest air passages (bronchioles) of the lungs are destroyed as a result of damaging exposure to cigarette smoke and other irritating gases and particulate matter.

Then following the riddance of the factors of influence for causing COPD the person still suffers from after effects because of the damage cause by the condition which during the prognosis of COPD the patients are brought into pulmonary rehabilitative phase

Pulmonary rehabilitation is a program of exercise, education, and support to help you learn to breathe and function at the highest level possible. In pulmonary rehabilitation there will be a team of specialists who will help at improving the current physical condition of the person affected. In pulmonary rehabilitation, they will learn about: breathing techniques, medications, nutrition, relaxation, oxygen, travel, how to do everyday tasks with less shortness of breath, and how to stay healthy and avoid COPD exacerbations and cope up with the changes that often come with COPD - depression, panic, anxiety, and others.

Pedometers are effective tools to ascertain accumulative ambulatory activity levels and can be valid predictors of daily energy expenditure. Pedometry has been associated with significant increases in physical activity, reductions in body mass index (BMI), and increased cardiovascular fitness.

Methodology

Subjects:

Subjects will be selected in accordance to the inclusion and exclusion criteria from outpatient and inpatient of physiotherapy department, Saveetha medical college and hospital.

Sampling Techniques:

Experimental study.

Sample Size:

Sample size is 30

Inclusion Criteria:

Patients with dyspnea score < 3(Borg's dyspnea scale)

Age group: 40-65YEARS

Male and female

Stable vital signs

Active participating patients

Exclusion Criteria:

Any other respiratory illness

Undergone recent surgery

Receiving specific medications for COPD

Deep venous thrombosis

Procedure was total of 30 subjects will be selected using convenient sampling technique bases on the inclusion and exclusion criteria .The study will be explained to the patients and written consent will be obtained from the subjects .Subjects will be allocated in two groups using randomized method of sampling.

Results

the Group A had significant improvement in PER; Whereas Group B showed a much significant result in all the outcome measures used and helped in improvement of quality of life and thus this indicates that pedometry along with conventional physiotherapy (Experimental) has increased the QOL and PER;(QOL *quality of life* , PER *perceived exertion rate*).

Table-I: Values of Post- test Comparison for Modified Borg's Dyspnea for Group A & Group B

MODIFIED BORG'S DYSPNEA SCALE		
GROUP- A	GROUP- B	
	POST TEST	POST TEST
MEAN	4.07	2.80
SD	0.80	0.77
P VALUE	0.0001	
T VALUE	4.4298	

Table-II: Values of Post- test Comparison for Six Minute Walk test for Group A & Group B

SIX MINUTE WALK TEST		
GROUP- A	GROUP- B	
	POST TEST	POST TEST
MEAN	358.33	396.33
SD	36.36	18.66
P VALUE	0.0012	
T VALUE	3.6011	

Table-III: Values of Post- test Comparison for Functional status questionnaire for Group A &B

FUNCTIONAL STATUS QUESTIONNAIRE		
GROUP- A		GROUP- B
	POST TEST	POST TEST
MEAN	68.73	81.4
SD	3.47	2.5
P VALUE	0.0001	
T VALUE	10581	

Discussion

The main finding of the study was that the patients with COPD, a programme of pulmonary rehabilitation had more or less mild impact on the individual's health, whereas a pedometer-based programme along with conventional physiotherapy had significant increases in daily steps count and well accomplished clinically significant improvement in health status and quality of life. This supports the concept that a simple app based tool combined with regularly used intervention, can have an important impact on this key determinant on the outcome of COPD⁹.

Karina M. Cancellero-Gaiad 2013 study showed that Diaphragmatic breathing favoured greater respiratory volumes and was able to increase SpO₂ saturation, These were incorporated in order to increase the diaphragmatic mobility and thereby reducing progression of severity of COPD and its suggested that its beneficial effects are on the basis of severity of the disease, adequate diaphragmatic movement¹².

André Luis Pereira de Albuquerque 2016 study inferred that COPD reports reduced exercise tolerance and show varying degree of dynamic hyperinflation during exercise and studies have suggested that there are differences among patients in terms of peripheral muscles to increase their respiratory capacity during exercise which explains of COPD patients are limited by peripheral muscle fatigue which infers in less body function capacity¹⁴.

Emily S. Wan 2017 study low physical activity is prevalent among COPD patients and has definitive association with quality of life and has increased risk of morbidity and death, the availability of pedometer monitoring allowed to examine the patient's regular base activity level and this enabled to improve day to day increased activity level of the patient but was done with no face to face contact with the patient¹⁵

Laura Mendoza 2014 study showed that patient's with COPD had mild beneficiary effect on the incorporation of regular pulmonary rehabilitation whereas pedometer-based programme produced a significant increase in daily steps count which accompanied with clinically significant improvement in health status¹¹.

The above studies stated that pulmonary rehabilitation had impact on patients respiratory status and it did not have any increase in patients quality of life and functional independency. Pedometer and conventional physiotherapy had significant increase in patients quality of life and was able to bring forward patients independency to a mild level and was able to maintain at times improve the patient's ability.

Conclusion

This study demonstrates that pedometer along with conventional physiotherapy can have a dramatic impact on patients with COPD and this being a cost effective method of treatment with basis of utilization of application available at free of cost can be used as a method for the increasing physical activity level and enhancing quality of life.

Limitation

1. The existing sample size is on small population.
2. The study was done on younger age groups.
3. The study duration was short.
4. The study cannot be done in higher dyspnea level.

Recommendation

1. The study can be done with more population.
2. The study can be done on Higher/ Older age groups.

3. The study to be done in longer duration of time.

4. The study to be done on other scales and questionnaire which may give more. Briefed information.

Source of Funding: Self

Conflict of Interest: Nil

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Inculcation of Voluntary Blood Donation Behaviour among Medical Students: An Interventional Study

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Abstract

Context: India faces a huge shortfall in procuring blood and young people are ideal candidates for Voluntary Blood Donation (VBD). Experiential learning is active learning by doing and this study explores its role in influencing the Knowledge, Attitude and Behaviour (KAB) of Medical students towards VBD. **Aim:** To evaluate the effectiveness of experiential learning on VBD behaviour among medical students. **Objectives:** 1. To assess the changes in the KAB of medical students towards VBD following the intervention. 2. To assess if such changes are retained over a longer period of time (6 months) among the medical students. **Settings & Design:** Prospective interventional study at NRIIMS, Vizag. **Methods and materials:** A sample size of 30 was selected by McNemar's formula for sample calculation. The KAB scores were assessed pre and post intervention. As a part of intervention students were subjected to Experiential Learning by motivating their peers (4) for VBD. The KAB scores were reassessed through delayed post-test after 6 months to know the long term effect. **Results:** The average score increased from 5.6 to 8.2 for knowledge which was found statistically significant ($P < 0.0001$), from 38.23 to 46.2 for attitude and practice of blood donation increased significantly from 10% to 66.7% ($P < 0.0001$ in McNemar's test). The results were consistent even after 6 months in delayed post-test. **Conclusion:** Experiential learning was successful, improving knowledge, attitude and behaviour towards VBD among students along with retaining the same in long run.

Key Words: VBD- Voluntary Blood Donation, RRC- Red Ribbon Club, KAB- Knowledge Attitude Behaviour, Experiential Learning

Introduction

One pint of blood can save 3 lives¹. To meet the Nation's basic requirement of blood, as per WHO a minimum 1% of its population need to donate their blood annually².

Despite a huge population, there is demand-supply gap in the country with 2012 WHO report saying only 9 million blood units are available annually, whereas the demand is 12 million units³. The only existing options of blood donations in India are- Voluntary Blood Donations (VBD) & Replacement/Family Donors. Literature points out to many factors which influence the VBD Behaviour of an individual. Young students are healthy, active, dynamic, resourceful and receptive; they also constitute a greater proportion of the population⁴. Experiential Learning is roughly defined as learning through reflection on doing⁵. Here the learner reflects

on the problem while doing the task, conceptualizes the problem and then comes up with solutions for it. This study explores the role of "Experiential Learning" in influencing the Knowledge, Attitude and Behaviour of Medical Undergraduate students towards Voluntary Blood Donations.

Objectives

1. To assess the changes in the KAB of medical students towards VBD following the intervention.
2. To assess if such changes are retained over a longer period of time (6 months) among the medical students.

Materials and Methods

Study design: Prospective Interventional Study

Duration of study: 8 months (May-December 2018)

Study Population: Medical Undergraduates

Intervention: Experiential Learning based on the Kolb Experiential Learning cycle, 1984⁶

Sampling Method: Simple Random sampling

Sampling frame: Members of Red Ribbon Club (RRC) of the institute

Sample size: 30

It was estimated based on McNemar's two-sided equality Z test for paired proportions⁷. Where α at 0.05, β at 0.8, we assumed 40% of participants will have positive and 5% may have negative change of behavior in terms of donating blood in future (for two sided equality). Applying these we got a value of 27 which was rounded up to 30 taking into account the attrition.

Study Tool: Pre-validated structured questionnaire having 4 sections assessing the- socio-demographic data, Knowledge, Attitude & Behaviour towards Voluntary Blood Donation. The Socio-demographic data included age, gender, blood type, academic year and parent's occupation, knowledge section had 10 multiple-choice questions. The correct answer was given a score 1 & wrong answer 0. The score of ≤ 3 , 4-5, 6-7 and > 7 were considered as having poor, satisfactory, good and excellent respectively. It also had 10 statements graded on five-point Likert-type scale (1 to 5) for assessing the attitude of the participants. The total score ranged between 10 and 50. An attitude score ≤ 25 , 26-34, > 35 were considered as negative, neutral & positive attitude respectively. Behaviour of the participants was assessed by 5 dichotomous questions, having either "yes" or "No" response.

The questionnaire, was validated by subject and medical education experts. The reliability was tested using internal consistency test (Cronbach's alpha coefficient 0.76).

Methodology

A pre-test was conducted for assessing KAB scores of the participants after an initial sensitization session. Then they were asked to influence their peers (Minimum 4) for Voluntary Blood Donation. Regular meetings were

held to check the progress towards completing the task. Initially none of them were able to find the donors. (Stage 1: Experience Stage of Learning). This problem made them analyse the situation by reflecting on the possible reasons of non-participation (Stage 2: Stage of Reflective observation). This reflective observation helped them to come up with their own innovative solutions. (Stage 3: Stage of Abstract Conceptualization). Finally they put all their abstract concepts into practice by influencing their peers to become a donor as an outcome. (Stage 4: Stage of Active Experimentation). This intervention was based on the Kolb Experiential Learning cycle (Fig-1), 1984⁶

During the process, different barriers to voluntary blood donation were identified like: fear of the procedure, lack of altruistic behaviour, misinformation, unawareness of benefits, fear of contacting diseases. Reflecting on the experience and conceptualizing the abstract thoughts they came up with different strategies to tackle the problems. Fear and misinformation were alienated by inviting the peers to participate and observe the routine activities in the Blood Bank. Similarly presenting a thalassemia and a post-partum haemorrhage case in the evening clinical wards, rewarding and felicitating the blood donors was tried as a solution for instilling an altruistic behaviour. Fear for attendance shortage was taken care of by issuing circular confirming attendance to all donors. Posters highlighting the benefits of Blood donation was put on gymnasium, hostel and dining hall. All these strategies were implemented to convince their peers for blood donation, along with showcasing their own interest on the occasion of World Blood Donors Day organized on June 14. After that a post-test was conducted and the difference in the knowledge score was analysed using paired T test. Long term retention was assessed 6 months after the event through delayed post-test.

Results: Majority (21) were females. The mean age was 22.27 ± 1.38 years. The most common blood group found to be B+ve (33.2%), O+ve (30.4%), and AB+ve (18.9%). Most of student's parent's occupation was non-medical (92.8%)

Pre-Test scores showed that the average knowledge scores was 5.6. Majority had satisfactory (16) or good (10) grades. While only 4 members had excellent grades.

The average attitude scores was 38.23 which indicates that students already had a positive attitude towards blood donation. Only 3 members had donated blood on prior occasion that too for an individual belonging to their own family. None had ever actively influenced their friends or peers to donate blood.

Post-Test scores showed the average knowledge score increased to 8.2. Majority had good (16) or excellent (14) grades. The pre and post test scores were compared by using two tailed Paired T test (Fig-2) and the difference was found to be statistically significant ($p < 0.0001$). The average attitude score was also improved to 46 .2.

Even though it wasn't mandated, most of the RRC members wanted to donate their blood, thus proving a change in behaviour. A total of 21 (66.7%) participants had donated blood compared to 3(10%) earlier. The

difference was found to be significant ($P < 0.0001$) using McNemar's test (Table-1). All 9 males successfully donated their blood, however due to prevailing anaemia only 12 out of the 21 females were able to do so. Every one actively participated in motivating their peers and each student was able to recruit more than 4 volunteers. (Fig-3,4).

Delayed post-test: Although the average Knowledge scores was reduced to 6.8, majority had good (19) or Excellent (8) followed by satisfactory (3) grades thus providing evidence towards long term retention of the knowledge. The delayed post test scores for knowledge compared with post test scores. (Fig-2). There was no change of attitude score. However 9 males and 12 females had donated their blood even 6 months after the blood donation camp showing the inculcation of VBD behaviour depicting the long term impact of experiential learning.

Table 1: Change in VBD behaviour before and after Intervention (Experiential Learning) (N=30)

		VBD After EL		Total
		No	Yes	
VBD Before EL	No	8	19	27
	Yes	1	2	3
Total		9	21	30

The difference was found statistical significant at $P < 0.0001$ using Mc'Nemar test

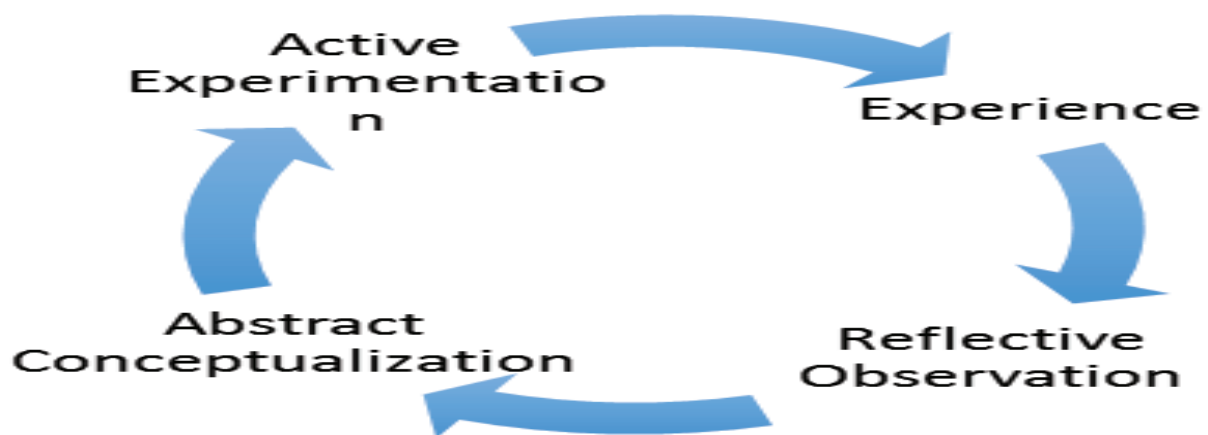


Figure 1: The four stages of experiential learning, based on Kolb Experiential Learning cycle, 1984

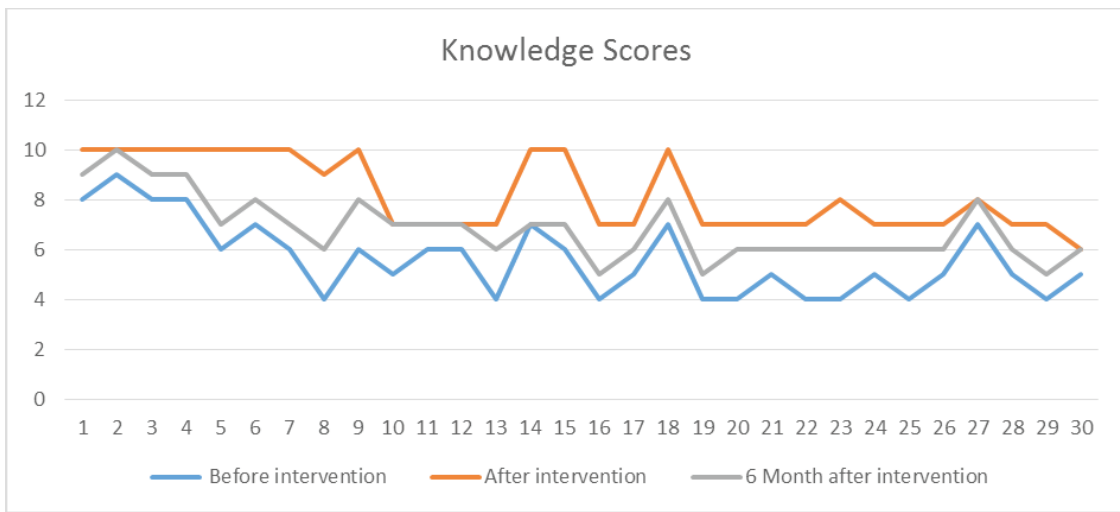


Figure:2 Comparison of Knowledge scores of the study participants (N=30) before , after and 6 month after the intervention

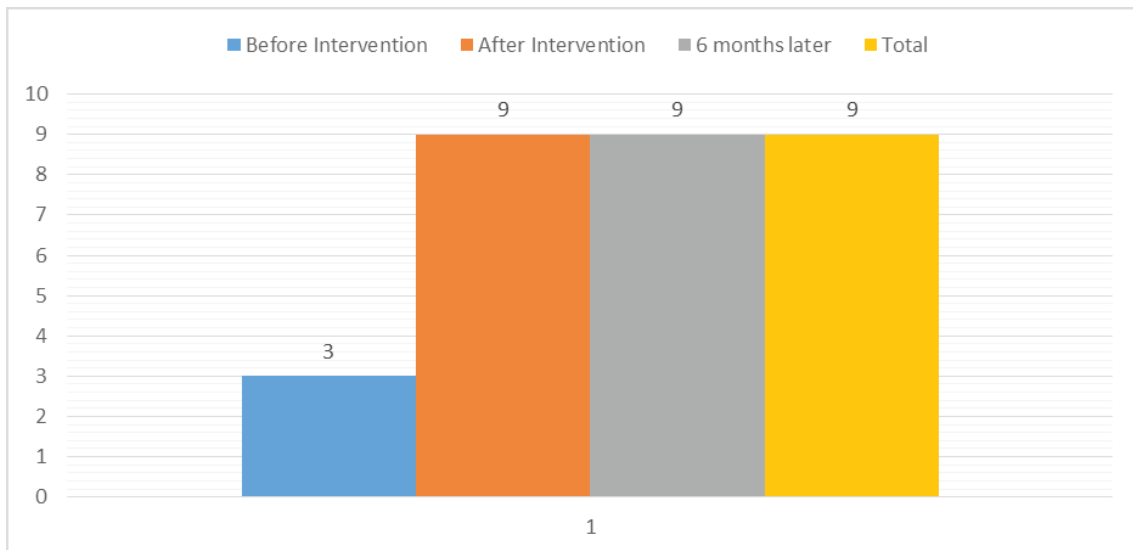


Figure 3: Practice of Voluntary blood donation behavior noticed among the male study participants (N=9) pre, post intervention and 6 months after intervention.

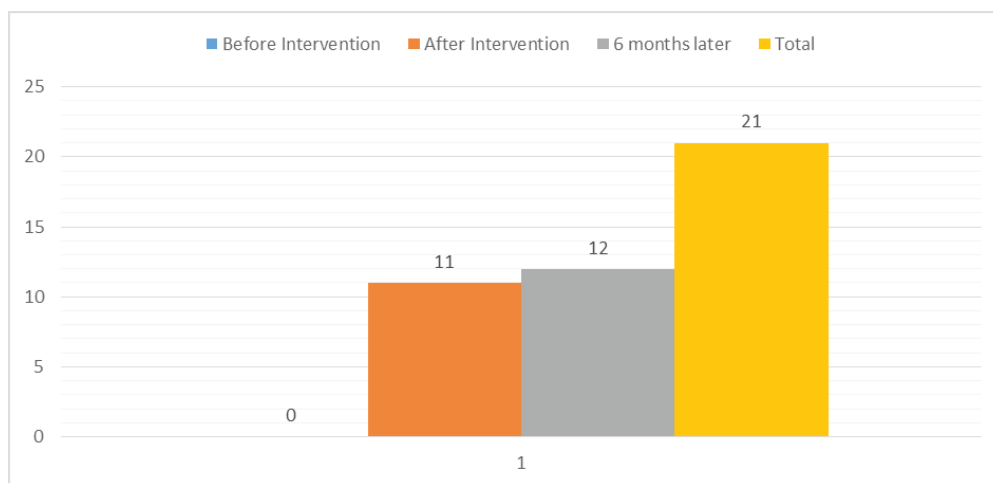


Figure 4: Practice of Voluntary blood donation behavior noticed among the female study participants (N=21) pre, post intervention and 6 months after intervention.

Discussion

WHO reported that 38% of voluntarily donated blood comes from those young people aged less than 25⁸. There is a need to motivate young generations to meet 100% voluntary non-paid blood donation. A significant correlation between educational status, and willingness to donate blood has been found in many studies. University students, are generally considered safer donors, specifically, those who study in the medical and paramedical fields because of their background knowledge and healthier lifestyle, which make them much less likely to transmit infectious diseases.⁹ The average age of the study participants in our study was 22 years, all of them were from medical stream.

Majority of the studies around the world have found that while females have a better knowledge about blood donation, in practice they lag behind their Male counterpart in volunteering to become a donor^{8,9}. The proportion of female donors was as low as 1.7%, 16% & 15.5% respectively¹⁰⁻¹². Such gap between knowledge and behaviour was also found before the intervention in our study, however post intervention, the female participants were more than willing to donate blood. Although interested only 12 out of 21 female students donated their blood attributed to prevalent anemia among adolescent girls in our country.

Likewise gap between having a positive attitude and actual practice was noticed in our study initially, where 38.2% were having positive attitude but 10% had donated blood. Similar findings were noticed in another study where the existing gap was highlighted.¹² The intervention not only improved their attitude further (average scores 46) but also brought in them a sense of altruism and interest to become a Voluntary Blood Donor.

Misinformation and fear about blood donation, willingness to donate for only family or friends, expectation of money as incentives were some of the factors hindering the practices of blood donation in developing countries¹³. Prevalent belief of harmful effect of Blood Donation on body causing weakness and loss of vitality was one of the hindering factor identified in our study. Some innovative strategies like distribution of certificates, badges to the donors, felicitation, ensuring attendance, sharing experience with peers were adopted

to bridge the gap between knowledge, attitude and behaviour.

In this study experiential learning had stimulated the study participants to come up with their own practical solutions to accomplish the task at hand. To bring about a change in the behaviour, many interventions were suggested in various studies like focusing on altruistic aspects of blood donations, incorporating an attitude of social responsibility among the youth, informing the youth about health benefits of Blood donations¹⁴⁻¹⁶.

Likewise few studies found that people will readily donate their blood if they are called upon to do so, also mass counselling as an effective strategy for influencing the blood donation behaviour^{17,18}. There was a lack of literature exploring about the efficacy of experiential learning in influencing Voluntary Blood Donation behaviour. Nonetheless most of the above cited interventions were utilized by the study participants during the stage of "Active experimentation" in their process of learning.

Conclusion

Medical students have a good knowledge and a positive attitude towards VBD, but there is a predominant gap preventing the translation into actual behaviour. Experiential Learning could be an effective way to bridging the gap and inculcating VBD behaviour among the youth. It can further improve the knowledge and attitude, and its utility should be further explored in different fields.

Acknowledgement: I acknowledge my gratitude to my co-researchers, blood bank staff and students of RRC at my institute for their help and support.

Limitation: Small sample size, only medical students (RRC members) are involved.

Funding: Self

Conflict of Interest: Nil

Ethical Clearance- Taken from Institutional Ethical committee

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Role of Glutamatergic System and its Level of Glutamate in Rat Migraine Model

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Abstract

Glutamate is a major mediator of excitatory signals in the nervous system and is involved in many physiologic and pathologic processes. The understanding of glutamatergic transmission in the nervous system has been greatly expanded and the family of ionotropic and metatropic glutamate receptors. The glutamate receptors are localized at nerve terminals postsynaptic sites and glial cells and thus, they can influence and modulate the action of glutamate at different levels in the synapse. Moreover, there is substantial evidence of glial participation in glutamate nociceptive processes and neuropathic pain. Present study explains the glutamate transporters are responsible for the level of glutamate in the synaptic cleft is principally dependent on neuronal glutamate transporters in rat model.

Keywords: Glutamate, Receptors, Transporters, Migraine

Introduction

Glutamate is a major mediator of excitatory signals in the nervous system and is involved in major physiologic and pathologic processes such as excitatory synaptic transmission, synaptic plasticity cell death and chronic pain glutamate exerts its signalling role by acting on ionotropic and metabotropic glutamate receptors.¹ Ionotropic receptors directly gate the ion channels located on the pre and post synaptic membrane, as well as, at extra synaptic sites. Glutamate concentration in the synaptic cleft determines the extents of receptors stimulation and excitatory synaptic transmission. The clearance of glutamate from the synaptic cleft is principally dependent on neuronal glutamate transporters that are present pre synaptically, post synaptically and peri synaptically.² Maintenance of extracellular glutamate concentration at physiological levels are critically important as excessive activation of glutamate receptors can lead to excitotoxicity and contribute to pathological role in various diseases. Glutamate participates in are functions of the nervous system and affects nervous system development at all stages, from neuron migration, differentiation and death

to the formation and elimination of synapses, glutamate receptors are broadly classified as ionotropic glutamate receptors and metabotropic glutamate receptors.³ The aim of the present study to explains the synaptic cleft is principally dependent on neuronal glutamate transporters in rat model

Materials and Methods

Male albino wistar rats (n=6) of weight ranging from 200g was the histomorphometry in the present study. The rats were obtained from experimental animal; facility of saveetha medical college. The animal was kept in cages with not more than the three animals in one cage.⁴ They were maintained at 12hrs:12hrs light/dark cycles with water and food available ad libitum.

Experimental Design

The rats were divided into three groups⁵

- Group 1 control rats (n=6)- saline treated rats.
- Group 2 migraine model rats (n=6)- Nitroglycerin (10mg/mg subcutaneous bark of neck) induced rat migraine for 7 days.

Glutamate Receptors

Ionotropic glutamate receptors have been identified in the CNS based on their pharmacology and subsequently through molecular biology. Their names are based upon the pharmacological agent that binds to the specific receptors subtype and selectively opens the associated ion channels, as follows the N-methyl D-aspartate (NMDA) receptors; the kainic acid (KA) receptors; and the α -amino 3-hydroxy -5-methyl -4-isoxazole propionate receptors (AMPA). The ionotropic receptors play critical roles in the basic transmission of nervous signals; they initiate neuroplastic changes in the CNS and are responsible for many diseases, including chronic pain.⁶

Metabotropic glutamate receptors are a family of seven transmembrane domain G-protein-coupled receptors, eight mGluR subtypes have been cloned and classified as follows group I (mGlu/x5) group II (mGlu2x3) and group III mGlu4 and 6-8). The mGluRs are classified based on their sequence and homology signal transduction mechanism and pharmacological profile.⁷

The main distinction between group I and group II &III is the different synaptic distribution of these receptors. Which is also a major factor that determines their function. (Fig-1)

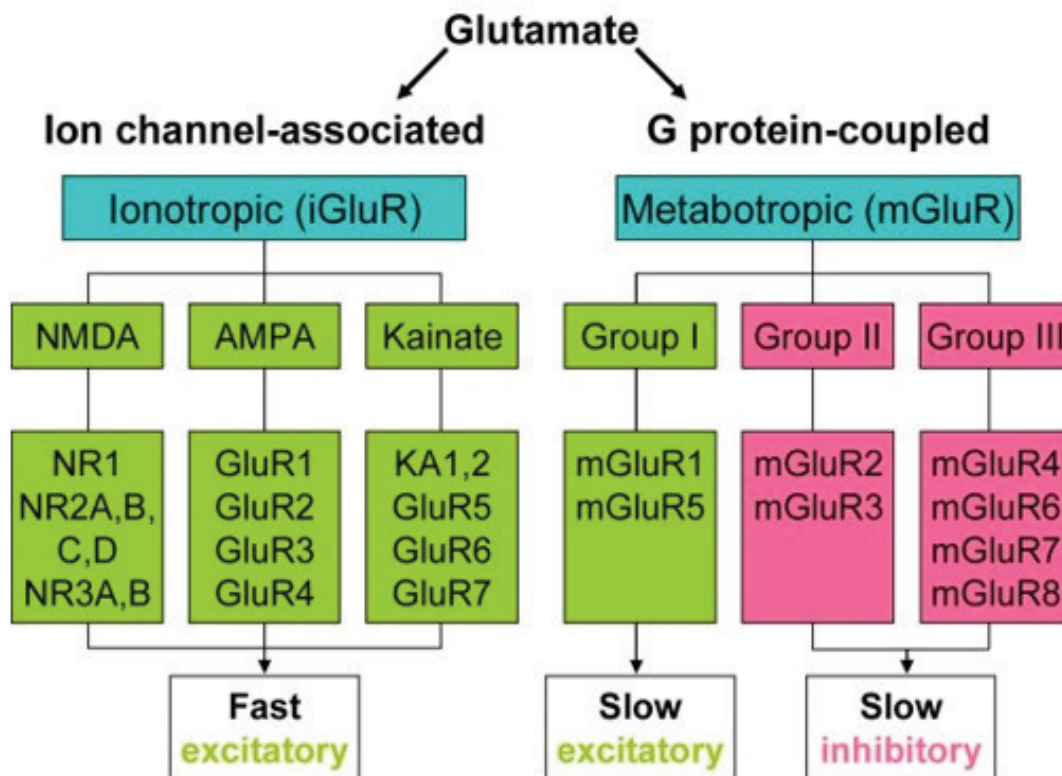


Figure 1: Glutamate Receptors

Glutamate Transporters

Excitatory amino acid transporters, also known as glutamate transporters, belongs to the family of neurotransmitter transporters, the EAATs terminate the excitatory signal by removal of glutamate from the neuronal synapses into glia and neurons glutamate transporter classified of which (EAAT₃), (EAAC₁) is

found in neurons while EAAT₁ and EAAT₂ are found in glial cells. Both glial and neuronal glutamate transporters play an important role in various physiological function. Such as plasticity, glutamate receptors activation and the maintenance and duration of extracellular glutamate concentrations.⁸

Vesicular glutamate transporter is responsible for the active transport of glutamate into synaptic vesicles, therefore it is essential for glutamatergic transmission in the peripheral and central nervous system.⁹ Vesicular glutamate transporter is also expressed and located in various secretory vesicles in non-neuronal peripheral organelles and can act as a paracrine and autocrine modulator to regulate cellular functions.

The list of Transporters, locations, cellular expression and its properties as follows;¹¹

1. EAAT 1, present at the level of Central nervous system (Highest Expression in cerebellum also detected in cortex, spinal cord) and it's expressed as Astrocytes and it expressed at the developmental stage of CNS.

2. Transporter EAAT 2, located at the throughout brain and spinal cord, it expressed in the form of primarily in astrocytes also; neurons, oligodendrocytes, responsible for >90% of total glutamate uptake.

3. Throughout the brain, especially cortex, hippocampus, cerebellum and basal ganglia, transporter EAAT 3, were expressed at the level of Post synaptic neuronal terminals also detected in astrocytes and major property had membrane expression under dynamic regulation by intracellular kinases and cholesterol. Possibly important in areas of higher neuro ganglia ratio

4. EAAT 4 transporter, expressed as Post synaptic neuronal terminals, also detected in astrocytes, presented at Soma and dendrites of Purkinje cells (Cerebellum). Also hippocampus, neocortex had property of High Cl conductance. Regulator of neuronal excitability, counteracting depolarization of neurons.

5. Property of High Cl conductance, expressed as rod photoreceptor and bipolar cells at the part of Retina as Transporter EAAT 5.

Migraine

Migraine is a common genetically linked neurovascular disorder. Approximately 12% of the Caucasian population are affected including 18% of adult women and 16% of adult men.¹² A notable female bias is observed in migraine prevalence studies with females affected 3 times more than males and is credited to differences in hormone levels arising from

reproductive achievements.¹⁰ Migraine is extremely debilitating with wide ranging socioeconomic impact significantly affecting people health and quality of life. A number of neurotransmitter system have been implicated in migraine. The pathophysiology of this disorder implicates both neurological and vascular mechanisms. Current research suggests that the trigeminovascular system plays a significant role in migraine vasculature and because various neurotransmitters peptides, receptors and transporters are located in this system.¹³

The glutamate receptors and glutamate transporters can contribute to neurologic dysfunction and could be useful molecular targets for treatment. EAAT transporters play a key role in the regulation of extracellular glutamate levels in the CNS. Where they protect neurons from excitotoxic damage. A number of studies have implicated EAAT_s in the pathophysiology.¹⁴

Alterations in the function or expression of components of this system may be involved in migraine susceptibility.¹⁵

Discussion

Glutamate is toxic to neurons in the brain can kill them when it persists in and around synapses, and is also able to initiate migraine by cortical spreading depression (CSD) they lynchpin of migraine aura, CSD has been studied experimentally and waves of CSD promoted by a wide range of stimuli including local mechanical stimulation, local injury, high frequency electrical pulses, potassium chloride, potassium ions, hypo-osmotic medium, metabolic inhibitors, glutamate receptors agonists, glutamate, acetylcholine and endothelin.¹⁶ These noxious stimuli perturb the neuronal environment leading to glutamate induced excitotoxicity. During CSD, glutamate contributes to a loss of membrane potential and disruption of ionic gradients (Ca²⁺, Na⁺, K⁺)Ca²⁺ and Na⁺ channels as well as glutamatergic and GABA ergic transmission are active in CSD and targeted by antiepileptic drugs. N-methyl D-aspartate (NMDA) receptors which are activated by glutamate, play an essential role in CSD mechanisms and antagonists of NMDA receptors have been shown to reduce CSD.¹⁷

Poor glutamate processing results in a built-up of extracellular which is toxic to neurons -overstimulation of glutamate receptors trigger a flood of Ca²⁺ into cells

which leads to uncontrolled continuous depolarization of neurons, a toxic process termed excitotoxicity.^{18, 19} Unregulated Ca^{2+} influx in turn activates a destructive cascade of events that triggers a number of enzymes, including phospholipases, endonucleases, and proteases such as calpain which destroy cell structure and components of the cytoskeleton membrane and DNA leading to the demise of the cells. Thus situation can

occur when not enough glutamate transporters are sluggish because of CNS injury or genetic defects that decrease the functionality of glutamate transporters.^{20, 21} Alterations in the expression, distribution, synaptic levels, recycling and autoregulation of glutamate receptors and transporters can result in altered glutamatergic function.²²(Fig-2)

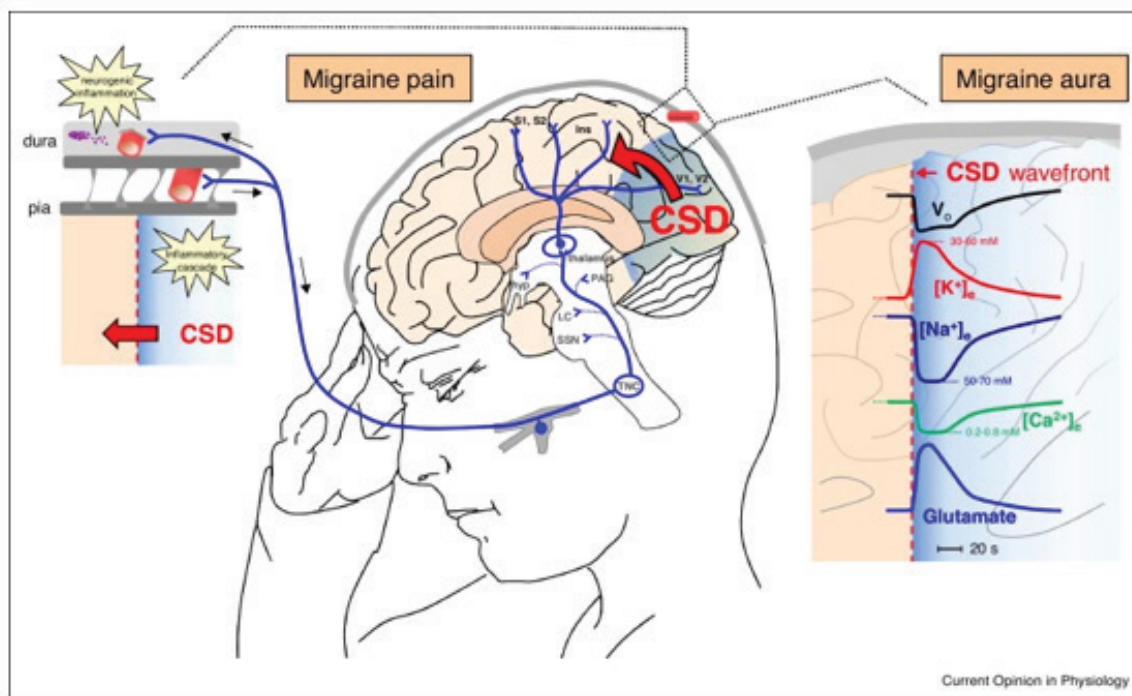


Figure 2: Glutamatergic System in Migraine

Conclusion

Migraine is a disorder, with hypothesised involvement of neurotransmitters, the major excitatory neurotransmitter of the brain glutamate and the receptors, upon which it acts are intimately involved in trigemino vascular nociceptive processing. This present study involved to find in animal studies suggests a line between glutamate and migraine and further suggest that glutamate plays a key role in migraine mechanisms.

Conflict of Interest: No Conflict of Interest

Source of Funding: Self

Ethical Clearance: Obtained from Institutional Animal Ethical Committee

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A Study on Human Milk Bank A New Initiation in Kerala

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Abstract

In India, where 40 out of every 1000 infants die before the age of 5 because of various reasons. In infant mortality rate, our nation remains highest in the world, followed by China. However, India is making good progress in reducing the infant deaths through a number of Government initiatives. One among those is human milk bank. Human milk is the only lifesaving, nutritious food that can keep an infant alive and healthy. Similar to the activities of a blood bank a breast milk bank works on to receive and supply donated breast milk to pre-term babies. Health experts call donated breast milk as 'liquid gold' and consider it as a boon for babies with poor health and a weak immune system. The number of milk banks are very less in India, when it is compared with the population growth rate. Human milk bank is totally a new initiative for Keralites. This study is focused to find out the significance of human milk bank and its level of awareness among nursing mothers in Kerala. It is also attempted by means of this study to find out whether they are ready to accept the novel public welfare concept.

Key words: *Infant mortality, Human Milk Bank, Liquid Gold, Nursing Mothers.*

Introduction

A mother is a female parent, who brought forth a kid. The human milk must be given to those kids who are undermined or in vulnerable condition of wellbeing due to their nourishment and body needs. Getting the most ideal beginning in the life is the inheritance of every single new-conceived infant. The animal milk or formula milk is not appropriate for a large portion of the human children and results in different wellbeing dangers. Here, comes the significance of a Donor Milk Bank. World Health Organization (WHO) expresses that the primary option in contrast to a natural mother not having the option to bosom feed is the utilization of human milk from different sources. A human milk bank helps those nursing mothers who not able to feed

their new born babies. The ideal nourishment for new-conceived new-born child is breast feeding, if possible for the principal year. Human milk banks offer a solution for the moms who cannot supply their very own bosom milk, for various reasons.

Milk banking is prepared contrastingly in various nations around the globe. Brazil is broadly recognized to have the broadest framework with numerous exercises for other people. France is the only country where Human milk banks are governed along with blood banks. In numerous nations, milk banking is still very constrained by absence of political will, because of strict religious concerns, and on account of moms' medical problems. In India, the first milk bank was set up in 1989, in Mumbai. Presently, just 50 milk banks are effectively working on the whole around the country. The idea of human milk bank is very new to Kerala. Now only the Indian Medical Association (IMA) alongside Rotary Club have proposed the making of milk banks at General hospital, Kochi and Jubilee hospital, Trissur in august, 2019.

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Statement of the Problem

Human Milk Banking is a significant medico -social

activity to the extent eventual fate of human race is concerned. Although, human milk banking flourishes in different nations, it is as yet not broadly acknowledged in India. At present there are no laws overseeing human milk banks in India. There is requirement for government and approach creators to outline rules, guidelines, and legislations in order to secure the privileges of mother and kid. Only a limited research has been directed about the human milk bank and about its social viewpoints. The purpose of this investigation is to evaluate the mothers' perceptions about human milk bank and whether they are ready to accept and donate human milk. Hence, the problem is stated as,

Nursing mothers perspective on human milk bank a new initiation in Kerala.

Objectives

1. To analyse the awareness level of human milk bank in Kerala among nursing mothers.
2. To study whether mothers are willing to donate their milk to human milk bank.
3. To find out whether mothers are ready to accept milk from human milk bank.
4. To identify the significance of human milk bank a public welfare initiative of the state.

Research Methodology

A descriptive study has been used for this research. Out of 12 Government Medical Collages in Kerala the researcher has selected three from among which are Kozhikode, Ernakulum, Thiruvananthapuram, total 150 samples, 50 from each on purposive sampling method. Structured questionnaire has been used for collecting primary data and distributed among nursing mothers. Statistical package for social sciences (SPSS) is used for analysis part. One- way ANOVA was used to measure the awareness level of mothers with that of their demographic factors. While secondary data has collected from various journals, articles and different websites.

Hypothesis

1. H₀: There is no significant association between demographic factors and awareness level of human milk

bank.

2. H₀: There is no significant association between the attitude of nursing mothers and human milk donation.

Review of Literature

Meghwal looked into the essential qualities of givers and beneficiaries, and the sums and defilement of bosom milk gave at the human milk bank from a tertiary consideration emergency clinic in south Rajasthan. The contributor pool comprised of 3117 moms. The exploration infers that the human milk bank serve a crucial capacity by giving human milk to untimely new-born children, hospitalized babies and other people who, for assortment of reasons, would some way or another not approach moms' milk. The utilization of contributor milk is generally supported. Also, building up an across the country system of human milk banking and effectively incorporating human milk banking administrations with new conceived consideration will additionally add to the advancement of milk banking and decreasing preventable new conceived passing. ⁽¹²⁾

Sangeeta explains the importance of health and good nutrition. The researcher explained about the knowledge and attitude regarding donating milk to human milk bank. For the purpose, a descriptive study is conducted among the selected hospitals. Total 60 samples were selected through non probability sampling convenience method. The result showed that there were no significant association between demographic variables. It also indicates that postnatal mothers have adequate knowledge and have a positive attitude towards donating human milk to milk bank. ⁽²⁾

Jahan aimed to increase the awareness level about human milk bank among mothers in developing countries. Human milk bank is well accepted and well known in developed countries. In this study a face to face interaction method is used to collect data about the knowledge and attitude. The discussion results explained that human milk bank is a solution to the mothers who are not able to feed their infants because of maternal illness or insufficient milk supply. Scientific studies and research reviews proved that donor milk is more preferable than infant formula. The researcher concludes with a wide scope for further research in this topic because only limited data is available about human

milk bank and its awareness. (3)

Yadav explored that getting the most ideal beginning in life is the privilege of each new conceived. The decision of encouraging is immediate at moms' bosom, on the off chance that impractical, at that point communicated mother's own milk, at that point gave crisp milk and in conclusion creature milk. The unregulated and uncontrolled utilization of creature or recipe milk proceeds in our general public imperilling wellbeing of things to come age. In India, weight of low birth weight babies in different medical clinics is about 30% to 40%. Human milk banks are principally focussed to give benefactor milk to high chance new-borns. At present there are no laws overseeing human milk banks in India. There is requirement for government and strategy creators to outline rules, enactment, leads in order to ensure the privileges of mother and kid. Human milk banking is a significant medicinal social activity to the extent fate of human race is concerned. Thus, government, wellbeing specialists and common society hold hands to engender idea of human milk banking for purpose of thousands of low birth weight and preterm babies. (4)

Cristina clarified about the current proof of the advantages and normal concerns getting from the utilization of contributor human milk in preterm babies. The remark additionally traces the hole in information

and gives proposals for training and recommendations for future research headings. Nearness of human milk bank doesn't diminish bosom nourishing rates at release, yet diminishes the utilization of recipe during the principal long stretches of life. Giver human milk ought to be given from a built up human milk bank, which pursues explicit security rules. Future research should concentrate on the improvement of milk preparing in human milk bank, especially of warmth treatment; on advancement of human milk fortress; and on future assessment of the potential clinical advantages of handled and invigorated contributor human milk. (7)

Mackenzie investigated mothers' information on and attitudes toward human milk banks to advice the advancement regarding human milk banking approaches and rules in South Australia should a milk bank be set up. The researcher has conducted a semi structured interview among 12 mothers who are pre-term or sick babies. The result shows that both breast feeding and potential mothers, unanimously supports to donating their milk to milk bank because the process of donating milk is easy and it is not time consuming. In addition to that mothers of pre mature babies are ready to accept donor milk from bank if they are assured the milk is safe and healthy. The mothers' in South Australia would welcome having access for both donating and receiving milk from donor milk bank. (6)

Analysis and Interpretation

1 One Way ANOVA					
1.1. Age of the respondent and awareness level					
Table No. 1					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.502	4	1.626	2.972	.021
Within Groups	79.868	146	.547		
Total	86.371	150			

Interpretation

The result of the above table reveals that F value is (2.972) is significant at (.021, p<0.05). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is significant association between the awareness levels of human milk bank with that of the age of the respondents.

1.2. Educational qualification and awareness level
Table No. 2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.954	4	.738	2.709	.032
Within Groups	39.801	146	.273		
Total	42.755	150			

Interpretation

The result of the above table reveals that F value is (2.709) is significant at (.032, $p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is a significant association between the awareness levels of human milk bank with that of the educational qualification of the respondents.

1.3. Attitude of mothers and human milk donation

Table No.3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.107	5	1.821	10.014	.000
Within Groups	26.376	145	.182		
Total	35.483	150			

Interpretation

The result of the above table reveals that F value is (10.014) is significant at (.000, $p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is significant association between the attitudes of mothers with acceptance of milk from milk bank.

3. Reason for not accepting milk from milk bank

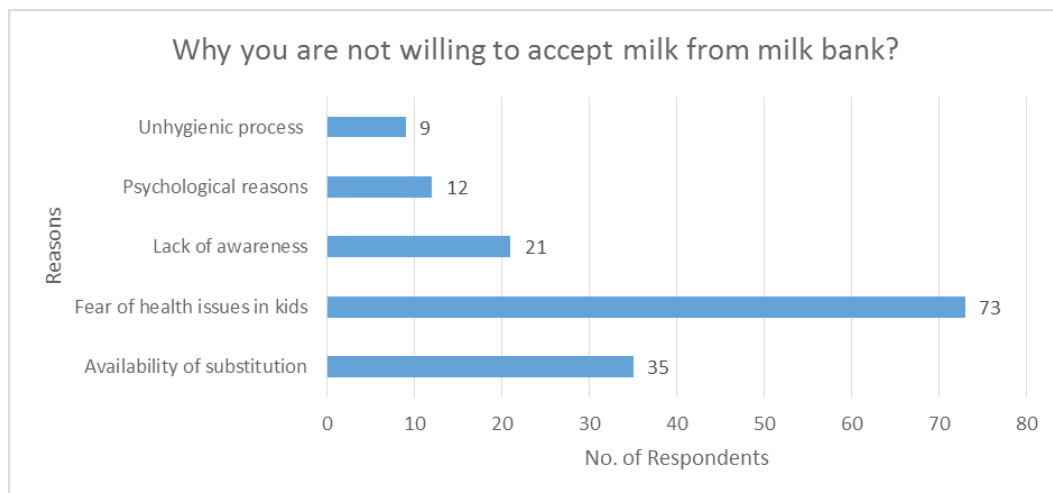


Figure No - 1

Interpretation

In the above chart, it is evident that 49% of the respondents are not ready to accept milk from milk bank because fear of health issues in kids. 23% says that availability of substitution, 14% says that lack of awareness, 8% says that psychological reasons and 6 % says that unhygienic process is the reason for not accepting milk from human milk bank.

4. Reason for not donating milk to milk bank

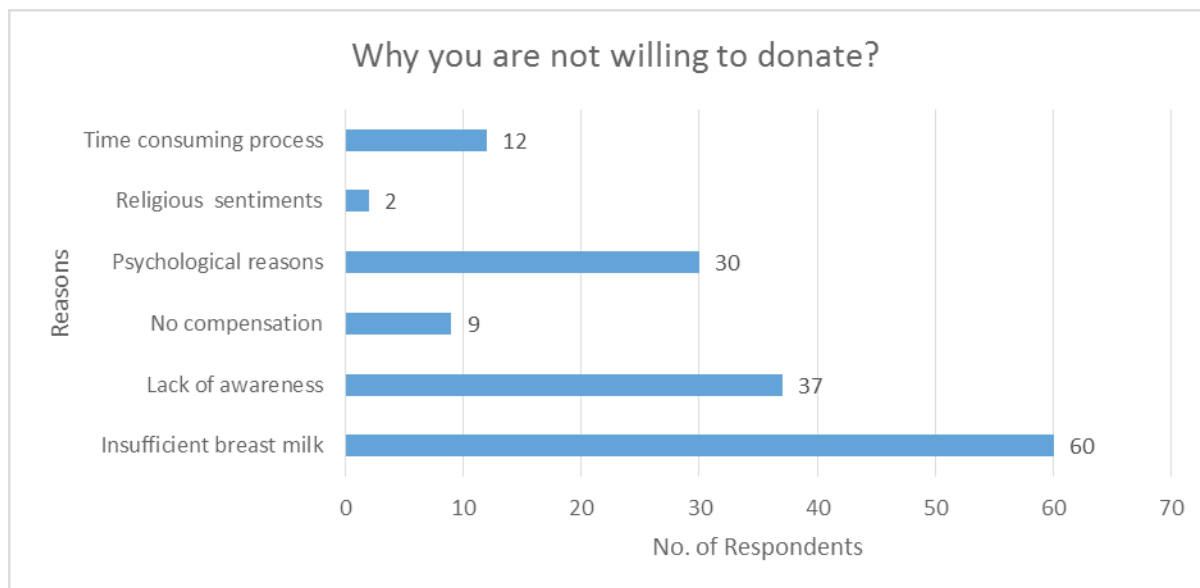


Figure No - 2

Interpretation

In the above figure, it is clear that 40 % of the mothers have insufficient milk to feed their own babies. 25% says lack of awareness, 20% says psychological reasons, 8 % says it is a time consuming process, 6% says no compensation for providing milk and only 1 % says religious sentiments for not donating milk to human milk bank.

Findings

Ø From the study it is found that most of the mothers belongs to the age group of 26-30 (48.2%) and followed by 31-35 (33.9%).

Ø Majority of the respondents (51.3%) belongs to the U.G. degree on education qualification and followed by P.G. degree (23.4%).

Ø Most of the mothers (63.1%) have single child and followed by 2 kids (30.3%).

Ø Mothers prefer to use formula milk (60.8%), if there is insufficient breast milk, the second preference is for animal milk (29.4%) and only few prefer donor's milk.

Ø From this work it is found that majority of the respondents (41.1%) are fully unaware about human milk bank and only (23.2 %) are partially aware about human milk bank.

Ø Most of the mothers (62.5%) are not ready to donate their milk to human milk bank.

Ø Almost all the mothers (40%) are facing a problem of insufficiency of milk to feed their own babies.

Ø Majority of the respondents (53.6%) have the opinion that accepting human milk from milk bank is not practical and effective.

Ø Fear of health issues in kids (48.6%) is the initial reason for not accepting human milk from milk bank and

followed by availability of substitution (23.3%).

Ø Few of the mothers have mentioned that human milk bank is slightly important (39.2%).

Suggestions

Ø Government should grant subsidies to hospitals other than medical colleges for the initiation of human milk bank.

Ø There is no proper regulation and act in this regard, so authorities can take some initiative to make regulations.

Ø There is no compensation for donating milk to milk bank, if it is paid one few may come forward to provide milk to milk bank.

Ø Authorities should give advises to mothers for healthy diet plan during the time of gestation period itself, to get sufficient breast milk after delivery.

Ø Wide range of promotion program is necessary to get familiarity about human milk bank.

Ø Awareness programmes are essential about the benefits of human milk bank to get donors and to avoid fear of receiving milk from milk bank.

Conclusion

In India, bosom milk donation is a rising idea and has been started in certain urban communities the nation over. Human milk banks assume a significant job in protecting another new born life. Instead of feeding directly, the bosom milk is gathered by milk banks and kept sterilized. The milk experiences the procedure of pasteurization and is put away in low temperatures. There is appropriate screening and appraisal of the mother before the milk is gathered. By doing so, the procedure of assortment and appropriation is safe and hygiene. However many are unaware about the process and the benefits of human milk bank. The study showed that mothers will prefer to use formula milk as substitution in case of insufficiency of milk. Fear of health issue is the main reason for not accepting donor's milk from milk bank. Mothers' are not willing to donate milk to milk bank because many are facing the problem, lack of breast milk. The study found that there is a significant association between the awareness level

and the demographic factors and also found that there is association between the attitude of nursing mothers and milk donation to milk bank.

The milk bank is a proven solution for spare the lives of the most delicate new-born against dangerous ailment and genuine diseases identified with pre-term birth. Therefore all nursing mothers should attempt to contribute their bit in this initiation to save lives. One's donated breast milk can help a little one to lead a healthy and longer life.

Ethical Clearance: No other organisation are pointed out in this research paper.

Source of Funding: Self

Conflicts of Interest: Nil

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Nutritional Status of Under-five Children in Northeast India: Effect of Household Socioeconomic Status

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Abstract

Aim: The study is an attempt to understand the effect of household socioeconomic status on both acute and chronic undernutrition in northeastern states of India.

Methods: The study used data from the National Family Health Survey (NFHS). Distribution analysis and concentration index were used to examine the effect of household socioeconomic status on undernutrition. The study population consists of 31,908 children under five years of age.

Results: The prevalence of stunting is decreasing significantly over time. While prevalence of wasting is seen to be increasing in states like Arunachal Pradesh, Assam and Sikkim. As the socioeconomic status of the household increases, the probability of both height-for-age and weight-for-height z-score less than -2 standard deviation decreases significantly. The variation in the distribution of z-score decreases as the household socioeconomic status increases. Similarly, the value of concentration index for all the eight states irrespective of rural-urban place of residence are negative. Except for Sikkim, the concentration of undernourished children is higher in a household with lower socioeconomic status in urban areas compare to their counterparts in rural areas.

Conclusion: The study shows the disproportionate concentration of undernutrition among the household with poorer socioeconomic status in northeast India. And the burden is higher in urban poor. Thus, an effort to balancing the socioeconomic inequalities accompanying with improving the accessibility of services to the poor is necessary for improving nutritional status for children under five years of age in northeast India.

Keywords: *undernutrition, socioeconomic status, northeast India, distribution analysis*

Introduction

Despite increased attention at the global and national level, nutritional deficiencies remain a devastating catastrophic multifaceted problem affecting infants, young children, adolescent and women ¹. Chronic undernutrition under five years of age hinders the mental and physical growth of children ²⁻⁵. Stunting and wasting in children under five year of age are the best indicators

for chronic and acute undernutrition respectively and is a strong prognosticator of both morbidity and mortality in this age group ⁶. Globally, 156 million children are stunted, 93 million are underweight, and 50 million are wasted, out of which 3.5 million are below one month of age ⁷⁻⁸. Compared to high-income countries, the burden of undernutrition is higher among low and middle-income countries, and they are now experiencing a triple burden of malnutrition ⁹. Majority of undernourished children resides in South Asia. Moreover, India accounts for about 62 million stunted children, 40 percent of stunted children globally ¹⁰. The underlying causes of this catastrophic multifaceted problems include household food insecurity, inadequate care and feeding practices and unhealthy household environment and inadequate health services while the immediate causes are insufficient

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dietary intake and diseases¹. Many studies have also articulated that there is a closed relationship between economic inequality and childhood undernutrition¹¹⁻¹⁴. Thus, reducing economic inequalities and improving the accessibility of services to the poor will be one of the key measures for improving nutrition and health practices for children under five years of age^{4, 15-16}. The World Health Assembly (WHA) targets to reduce the burden of undernutrition and overweight and increasing exclusive breastfeeding of newborns within six months of age by 2025¹⁷. Achieving these targets for a country hinges on the improvement of healthcare infrastructures and reducing the socioeconomic inequalities.

Northeast India consists of eight smaller states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Due to its poor healthcare coverage and lack of healthcare infrastructure, all the eight northeastern states has been given particular focus under the National Rural Health Mission (NRHM). NRHM is a mission for the government of India that aims to achieve universal access to equitable, affordable and quality healthcare to people or community in needs (<https://nhm.gov.in/>). Furthermore, compared to other Indian states, these eight states are both demographically and economically lagging. Thus, considering the lag in the healthcare infrastructure of the region, the study aims to address the effect of household socioeconomic status on both acute and chronic undernutrition.

Methods & Materials

Data

Data from both the third (2005-06) and fourth (2015-16) round of NFHS were used to highlight the change in the prevalence of acute and chronic undernutrition over time. While the effect of household socioeconomic status on undernutrition is studied using the fourth round. NFHS is a nationally representative survey providing information on vital maternal and child health indicators, including the nutritional status of children under five years of age following the standard anthropometric measures. The study population consists of 31,908 children under five years of age.

Methods

The impact of household socioeconomic status on

acute and chronic undernutrition is examined in two ways. First, the distribution analysis was used to estimate the probability of z-score less than -2 standard deviation. R-Software was used for the distribution analysis. Second, the concentration index, which is a standard tool to examine the significance of socioeconomic inequality for the health outcome, was used¹⁸. The value of the index ranged from -1 to 1. A zero value of the index implies for no socioeconomic differential, a negative value means the burden of undernutrition is concentrated among those disadvantaged population. While the opposite is true for the positive value of the index. The index was estimated using STATA 13, considering the household wealth index as the welfare variable (<http://fmwww.bc.edu/RePEc/bocode/c/concindexi.hlp>).

Both height-for-age and weight-for-height were used as the primary indicators of undernutrition. These measures are expressed in terms of z-scores standard deviation from the median of 2006 World Health Organization (WHO) international reference population¹⁹. Stunting is defined for those under-five children whose height-for-age z-score is less than -2 standard deviations. Similarly, wasting is defined for those under-five children whose weight-for-height z-score is less than -2 standard deviations. The fourth round of NFHS provides the household wealth index both for a rural and urban place of residence and are used as the proxies for household socioeconomic status.

Results

Change in the prevalence of Undernutrition from 2005-06 to 2015-16

Figure 1 shows the change in the prevalence of stunting and wasting among under-five children in northeastern states of India. Over the last decade, the prevalence of stunting has decreased in all the eight states. In 2015-16, its prevalence ranged from a minimum of 24 percent to a maximum of 44 percent. Prevalence of stunting among under-five children is highest in Meghalaya with 44 percent. Assam also has a relatively higher prevalence of 36 percent. With only 24 percent prevalence, Tripura is the state with the lowest prevalence of stunting among the eight northeast states of India.

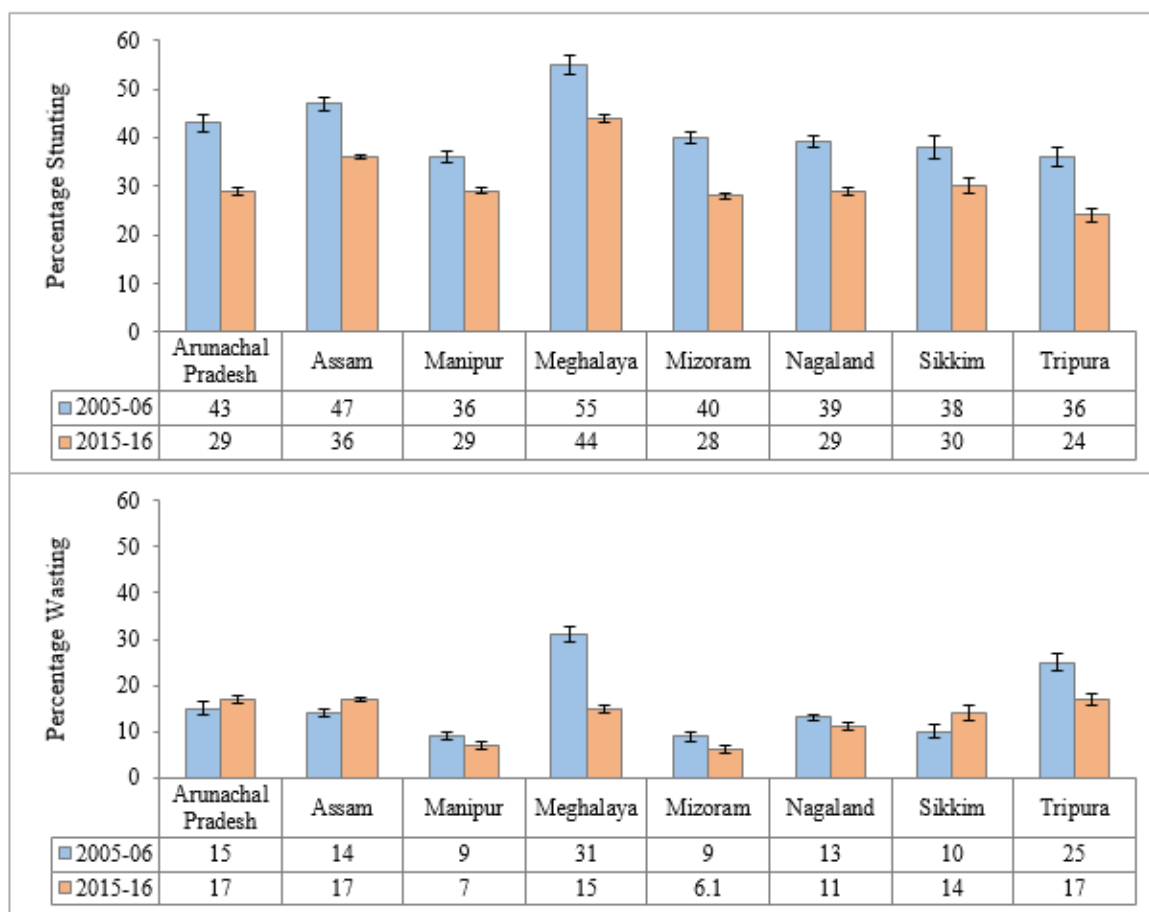


Figure 1: Prevalence of stunting and wasting among under-five children in northeast India.

Apart from stunting, wasting also plays a significant role in determining the level of undernutrition in a region. Its prevalence in 2015-16 ranged from a minimum of 6.1 percent to a maximum of 17 percent. The level of wasting for Arunachal Pradesh, Assam and Sikkim are increasing over time. In 2015-16, Mizoram has the lowest prevalence of wasting of 6.1 percent and Arunachal Pradesh, Assam and Tripura have the highest prevalence of wasting of 17 percent each.

Impact of Household Socioeconomic Status on Acute and Chronic Undernutrition

Figure 2 graphically presents the nature of change in the distribution of z-scores with different levels of household socioeconomic status. The distribution of both height-for-age and weight-for-height z-score is shifting from left to right. But the difference in the shift is more significant in height-for-age z-score. In both cases, the distributions are nearly symmetric. It can also be seen that the variation of distribution of height-for-age z-score is decreasing as the household socioeconomic status increases. In addition to this, the probability of z-score less than -2 standard deviation in both height-for-age z-score and weight-for-height z-score decreases significantly as the household socioeconomic increases.

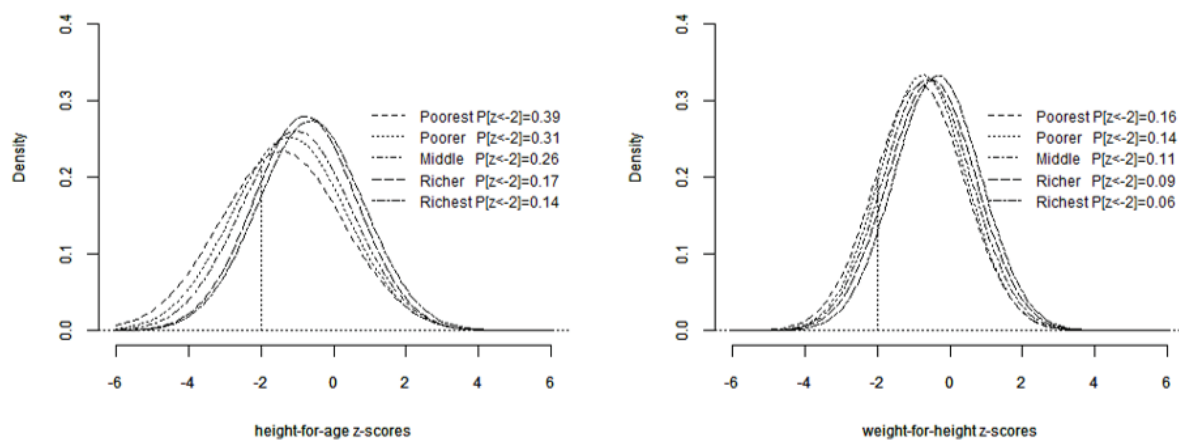


Figure 2: Distribution of z-score by household socioeconomic status among under-five children.

Similar to the results of the distribution analysis of z-score. The concentration index in Table 1 consistently gives the negative value for both chronic and acute undernutrition, reflecting the concentration of burden of undernutrition among the household with the low socioeconomic status. Table 1 also supports the results from distribution analysis, across all eight northeastern states and the rural-urban place of residence, children from a household with lower socioeconomic status share the highest-burden of undernutrition because of undernourishment and poverty. It is also interesting to mention that, in both chronic and acute undernutrition, the concentration of malnourished children is higher in an urban household with lower socioeconomic status as compared to their counterpart living in the rural areas. Except for Sikkim, the pattern was consistent across all the remaining seven northeastern states of India.

Table 1: Concentration Index for chronic undernutrition (stunting) and acute undernutrition (wasting) across northeastern states of India by place of residence.

State	Concentration Index (Stunting)			Concentration Index (Wasting)		
	Rural	Urban	Total	Rural	Urban	Total
Arunachal Pradesh	-0.29(0.02)	-0.48(0.07)	-0.34(0.02)	-0.40(0.03)	-0.58(0.08)	-0.46(0.03)
Assam	-0.28(0.01)	-0.46(0.04)	-0.32(0.01)	-0.23(0.01)	-0.37(0.04)	-0.27(0.01)
Manipur	-0.24(0.01)	-0.36(0.02)	-0.27(0.01)	-0.35(0.03)	-0.44(0.03)	-0.36(0.02)
Meghalaya	-0.26(0.01)	-0.36(0.03)	-0.29(0.01)	-0.21(0.02)	-0.26(0.05)	-0.23(0.02)
Mizoram	-0.24(0.02)	-0.32(0.03)	-0.30(0.01)	-0.38(0.03)	-0.59(0.06)	-0.49(0.03)
Nagaland	-0.28(0.02)	-0.53(0.05)	-0.36(0.02)	-0.32(0.02)	-0.41(0.05)	-0.35(0.02)
Sikkim	-0.74(0.10)	-0.52(0.13)	-0.65(0.07)	-0.93(0.16)	-0.51(0.14)	-0.75(0.11)
Tripura	-0.32(0.03)	-0.55(0.08)	-0.41(0.03)	-0.25(0.03)	-0.36(0.06)	-0.28(0.02)

Note: Concentration Index (Standard Error)

The concentration index was calculated based on the order of the household wealth index.

Discussion

The present study discusses the effects of household socioeconomic status on nutritional status in northeast India. It is the study that aim to highlight the nutritional status of the eight northeastern states of India, for which a dearth of information is available.

With all the efforts being taken up at the national and international level on the reduction of risk of morbidity and mortality due to undernutrition, there is still scope for further reduction of the prevalence of undernutrition of under-five children in northeast India. The study experiences a significant decrease in the prevalence of stunting over time in all states of northeast India. However, the estimates from the fourth round of the survey reveals that the prevalence of stunting in northeastern states of India is still high as compared to the other developed Indian States¹⁹. Also, the prevalence of stunting varies widely across different Indian states²⁰. Although, the prevalence of wasting in northeastern states is less than the national average¹⁹, its prevalence is increasing in states like Arunachal Pradesh, Assam and Sikkim. This is the situation of losing one while chasing the other. Many studies have shown that the risk of undernutrition is higher among those children belonging to the household with poorer socioeconomic status as compared to that household with higher socioeconomic status^{12, 13, 21-22}. But they fail to quantify the shifting pattern of distribution of z-score with different levels of household socioeconomic status. The present study provides the probability of z-score less than -2 standard deviation which quantifies the nature of shifting of z-score distribution across different levels of household socioeconomic status. The distribution of z-scores is shifting towards the household with higher socioeconomic status. And, the probability of z-score less than -2 standard deviation decreases significantly as the household socioeconomic status increases. As both stunting and wasting are defined for their corresponding z-score less than -2 standard deviations. The shift in distributions of z-score clearly tells the concentration of undernutrition in the household with poorest socioeconomic status. The other interesting finding that we can infer from the distribution analysis is that the variation in the distribution of z-score decreases as the household socioeconomic status increases. And the reason for such outcome is not known and can only be

known considering the data quality. Such results can be an intriguing factor for future research on influence of socioeconomic status on undernutrition. The findings from the distribution analysis is also supported by the findings from the analysis using the erstwhile method for examining health inequalities i.e. concentration index. In all eight states and rural-urban place of residence, the burden of undernutrition is concentrated among the household with lower socioeconomic status. Generally, studies show a higher concentration of undernourished children in rural household with poorer socioeconomic status²¹⁻²². But it is surprising to see the higher concentration of malnourished children in a household with low socioeconomic status in urban areas as compared to the household with low socioeconomic status in rural areas. This finding is consistent for all the northeastern states excluding Sikkim. This may be due to presence of higher socioeconomic inequalities in urban areas compared to rural areas. Thus, from the policy perspective point of view, there is need to decrease the socioeconomic inequalities to reduce the burden of undernutrition in northeast India.

The study is limited to the information available in the NFHS. While studies have identified several nutrition-specific interventions which would successfully eliminate several hundred thousand deaths due to undernutrition in nutrition-burden countries²³. But, the non-availability of nutrition-specific survey of India leads to the use of data from the NFHS.

Conclusion

The study shows the disproportionate concentration of undernutrition among the household with poorer socioeconomic status in northeast India. And the burden is higher in urban poor. Thus, an effort to balancing the socioeconomic inequalities accompanying with improving the accessibility of services to the poor is necessary for improving nutritional status for children under five years of age in northeast India.

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Perceived Barriers of Communication between Nurses and Patients in a Tertiary Care Hospital

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Abstract

Background: Communication is a key element in providing high quality health care services, leading to patient satisfaction and better health. Patient- centered communication is a basic component of nursing and facilitates development of positive nurse-patient relationship. **Objectives:** 1) To determine barriers of communication between nurses and patients 2) To provide evidence based recommendations. **Materials and Methods:** A descriptive cross sectional study was conducted among 100 nurses & 50 patients during May to July 2019. Separate questionnaires were used for nurses and patients containing socio-demographic details and barriers of communication along with open ended questions. **Results:** All the nurses were females. 85% were in the age group of 21-30 years. Majority of patients were either 21-30 years (36%) or >40 years (36%). 52% of the patients were females. Unpleasant experience in past with patients (mean score-4.11) and use of technical terms by the nurses (mean score-3.28) were main perceived barriers to effective communication among Nurses and patients respectively. Thematic analysis of open ended questions revealed some important barriers and ways to overcome it, such as more staff recruitment, provision of enough time to know the patient, patient's sensitization with their assigned nurses and hospital environment, regular training in communication skills. **Conclusion:** Unpleasant experiences in past and use of medical jargons were the important one among many as perceived by nurses and patients respectively, which can be tackled by effective communication training of nurses, sensitization programme for patients and increasing the nurses: patient ratio as suggested by the participants.

Key words: communication, barriers, nurses, patients, environment, thematic map

Introduction

Communication is a multidimensional, complex and dynamic process.¹ Lack of effective communication is a major obstacle to render standard services in health care. This can result in patient becoming anxious, misunderstanding between nurse and patient, incorrect diagnosis and treatment, financial burden on patient due

to increased hospital stay leading to dissatisfaction²

Appropriate nurse patient communication results in standard care which promotes health and satisfies the patient.³ Irrespective of their specialty every nurse needs to communicate with patients.⁴ Ill health and hospitalization place stress on patients and their families and are unpleasant. Nurses play a important role through proper communication in decreasing their unpleasant experiences.¹

Limited training in using correct strategies such as listening to patients is one of most common barriers in health communication. Furthermore language type and technical terms also hinder effective communication.⁵ .^{6, 7} According to previous studies, work overload , no proper facilities for nurses are also barriers for nurses⁸

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Cultural variations, literacy status, health beliefs, signs and symptoms of disease, language misunderstanding are some of the barriers encountered in patients. Needs of the patient especially sensory, physical and physiological also negatively affect communication^{7,9} All disabilities hinder patient–nurse communication. Some factors like religion and ethnicity contribute unconstructively to effective communication^{5,7,10}

In this study we aimed to determine the barriers to nurse –patient relationship from perspective of nurses and patients and to provide recommendations to improve the quality of services leading to better health care and satisfaction of patients and their relatives.

Materials & Methods

A cross sectional study was conducted among nurses and patients attended by them during May 2019 to July 2019

Inclusion criteria:

- Qualified nurses (Qualification of BSc or GNM) and patients who are looked after by them at least for 3 days
- Nurses and patients who were willing to take part in the study

Exclusion criteria:

- Nurses and patients suffering from chronic/severe illness
- Incomplete/partially answered questionnaire form

Sampling technique and sample: Participants were selected pertaining to inclusion and exclusion criteria through complete enumeration. 100 nurses and 50 patients available at the various in-patient departments who consented were enrolled in the study.

Methodology

Data was collected by self-administered questionnaires from nurses and a questionnaire based interview from patients. The questionnaire was divided into 2 subsections which included demographic characteristics of participants, nurse-related barriers

for nurses and patient -related barriers for patients on a Likert scale of 1 to 5 (where 1= strongly disagree 2=Disagree 3=Don't know 4=Agree 5=Strongly agree) along with few open ended questions on nurse-patient relationship and suggestions to overcome barriers. The responses were analysed using descriptive statistics such as frequency, percentage, proportion & mean. The entire questionnaires were checked to ensure that they have been answered completely. Data was analyzed using Epi info. After approval from Institutional Ethics Committee, permissions were sought from Medical Superintendent, RMO and Nursing Superintendent. The participation of each patient was voluntary and written consent was obtained from them. To ensure validity the study tool (questionnaire) were given to nursing educators, administrators & subject experts for their input. The designed questionnaires were further pretested on 40 participants, Reliability using Cronbach's alpha correlation coefficient was 0.87 which is an accepted value.

Results

Nurses demographic characteristics:

A total of 100 nurses took part in the study. All the nurses were females. More than half (85%) of the nurses were in the age group of 21-30 years, followed by <20 years (14%), 31-40 years (1%). Most of them were Hindus (87%), followed by Christians (13%).Majority belonged to either Scheduled Caste (34%) or Scheduled tribes (34%). Rest were others (22%), OBC (8%) and General (5%) category.

Similarly most of them were graduates (92%), having the designation of staff nurse (86%), working either in IPD (45%) or ICU (39%) with >2 year of working experience (72%).

Nurse related communication barriers:

Most common barrier to effective communication was unpleasant experiences in past with patients with 84% either strongly agree or agree to the statement and highest mean score of 4.11 followed by lack of time (59%, 3.29), age difference (44%, 2.24), gender difference (28%, 2.27), unable to answer queries (24%, 2.20), noncompliance of patients (19%, 2.21), lack of interest (17%, 1.89). (Fig 1)

67% nurses stated they were overworked. 60% of them had good, 39% had very good and 1% had poor relationship with their colleagues. 60% stated about the existence of some sort of health problems and 13% about family problems.

Patient demographic & clinical characteristics:

Out of 50 patients, most of them were either in age group of 21-30 years (36%) or >40 years (36%), followed by 31-40 years (16%) and <20 years (12%). More than half (52%) were females and majority were Hindus (72%), followed by Muslims (22%), Christians (4%), and others (2%). 20% belonged to OBC, 18% General, 12% SC, 4% ST and 46% other category. Only 58% of them were literate. Likewise 62% were employed, 74% were married, admitted into medicine (20%), O&G (16%), ICU (10%) and stayed 3-5 days in the hospital (40%).

Patient related communication barriers:

Use of technical terms by the nurse was the

major patient related barrier with 62% either agree or strongly agree with the statement and mean score of 3.28 followed by lack of privacy (56%, 3.2), anxiety, pain, physical discomfort (48%, 2.86), misinterpretation of communication by the nurse (32%, 2.34), age and gender difference (28%, 2.06). lack of confidence in the nurse (26%, 2.32), reluctance to communicate (26%, 2.22), negative attitude of nurse (24%, 2.08), language (22%, 2.18) (Fig-2)

There are few open ended questions on their personal opinion on existing barriers and how to overcome the barriers of communication, which led to qualitative data which was analyzed by thematic analysis. The additional factors related to environment were unveiled through the open ended questions. The themes emerged to overcome the barriers were more staff recruitment, hiring male nurses, provision of enough time to know the patient, patient’s sensitization with their assigned nurses and orientation to hospital environment, regular training of nurses in communication skills. (Fig-3)

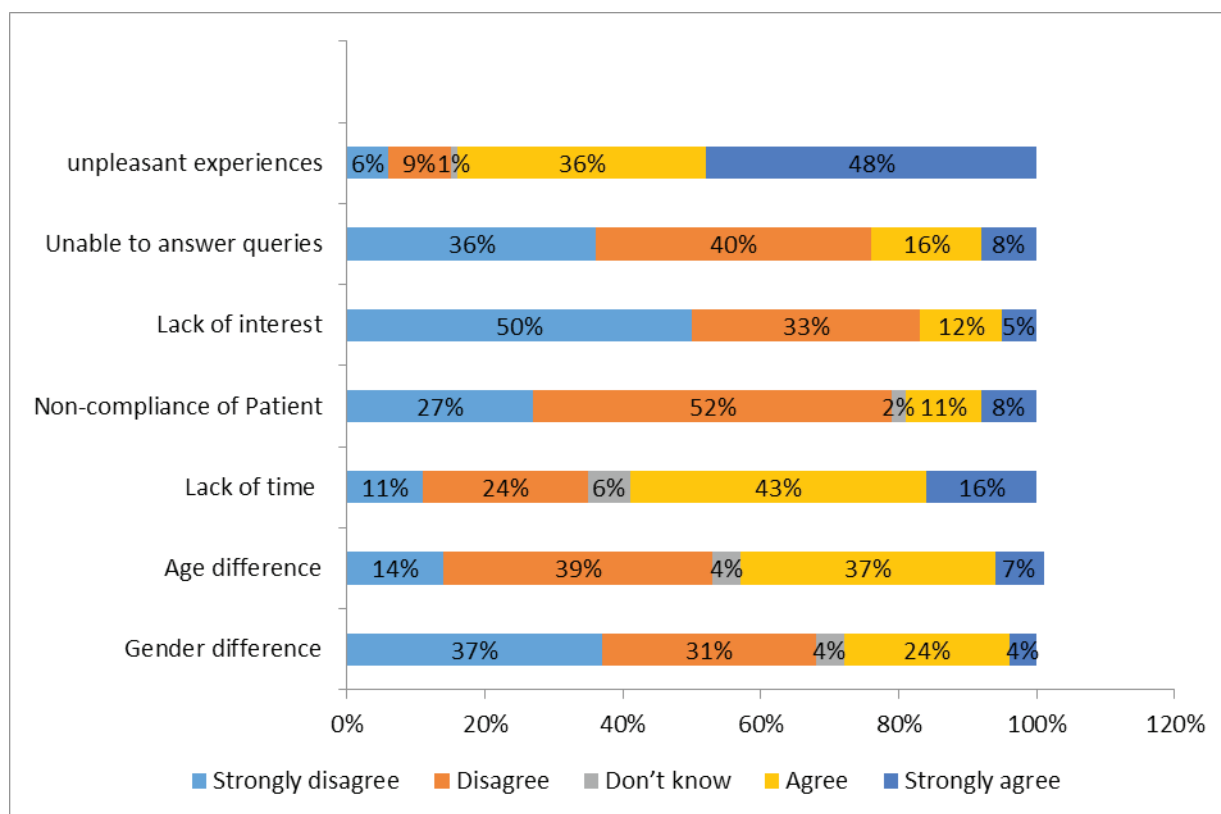


Fig 1 Nurse related communication barriers (N=100)

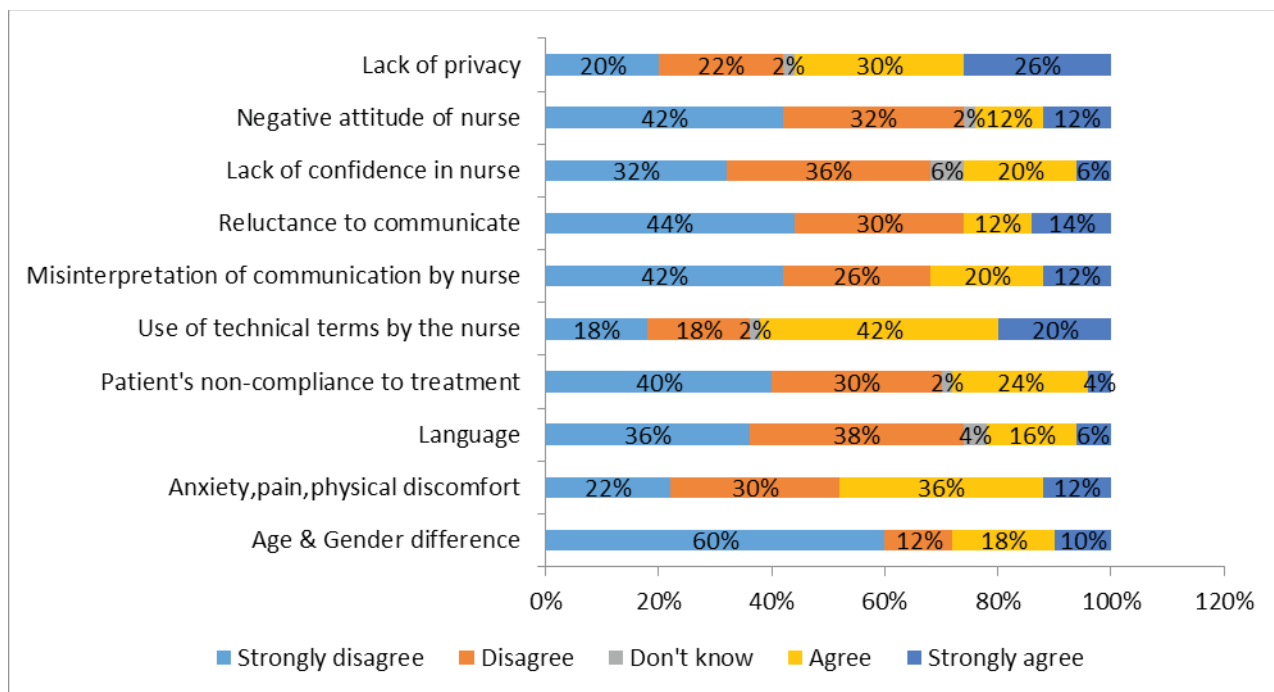
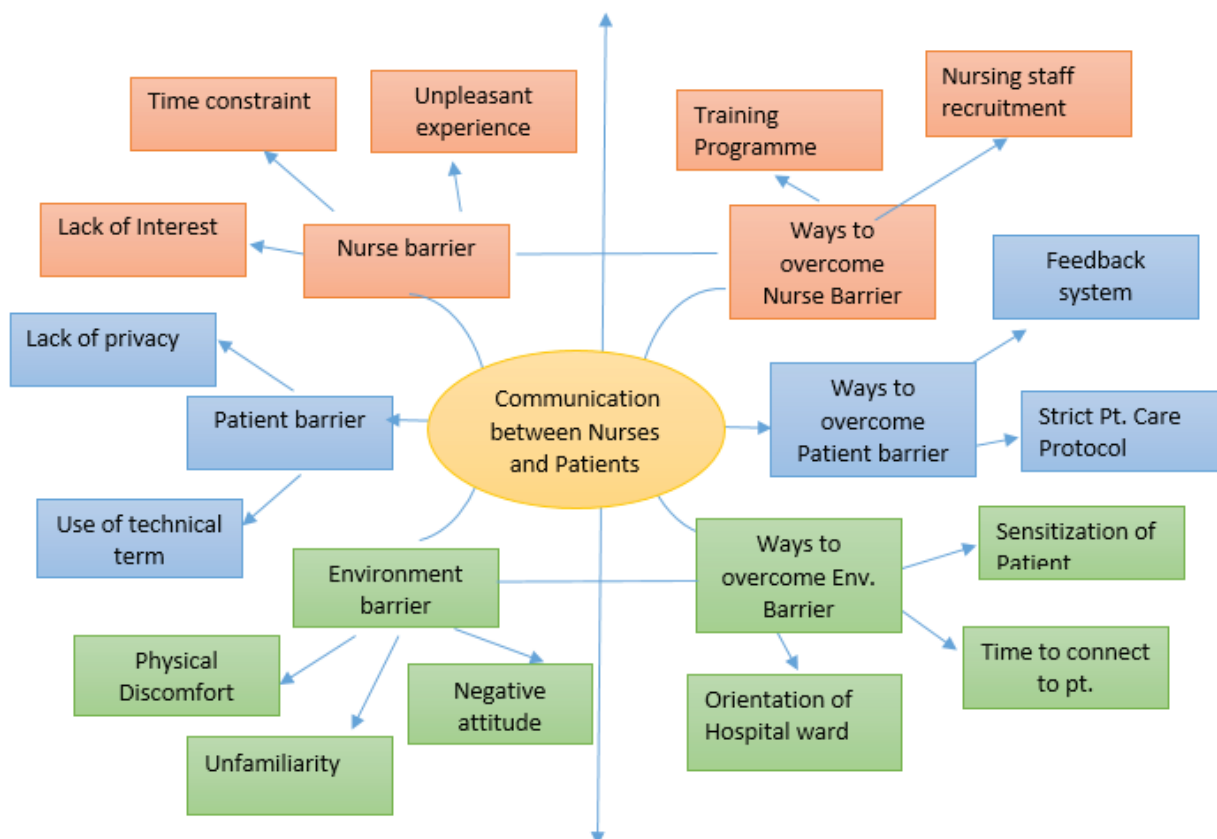


Fig 2: Patient related communication barriers (N=50)

Fig 3: Thematic Map on Barriers of Communication and Ways to overcome it:



Discussion

Effective communication between nurse and patient demands a multi-dimensional approach for a message to go from sender to receiver. Where nurse should be knowledgeable, empathetic, able to connect with the patient and address the need, similarly patient should be co-operative, able to trust the care provider and express the need. At the same time it demands a healthy and friendly environment to support the transfer of message properly. Any imbalance from any dimension may result in poor communication hampering health care outcomes in terms of patient's health and satisfaction. In the study we found many prevalent barriers of communication between nurses and patients resulting strained nurse – patient relationship. Unpleasant experiences of nurses in past with patients was a major barrier for effective communication. Similarly, Decreased satisfaction of nurses as well as provision of quality health care was attributed due to stress, overwork, and lack of welfare activities¹¹. Health problems and family problems faced by the nurse also hinder effective communication.

There is lack of enough time for effective communication for nurses in this study. Regarding nurses who overworked, the main reasons were shortage of staff and increased case load. This support a study which revealed that shortage of nurses increases work load and there is lack of time for effective communication.¹²

Gender and age difference between nurse and patient were perceived as a less important in the list. Similar results were found in a study where nurses were less affected by patients' gender while performing their duties and age differences did not hinder nurse-patient relationship¹³

While looking at the other end of the communication process, use of technical terms by the nurse was the most common barrier to effective communication as perceived by patients in this study. Similar findings were observed in another study where health care personnel often distance themselves from patients using technical terms which also scares the patient. It was commended that nurses should use language which is easily understood by layman.¹⁴ Another study stated that health information must be of good clarity, attractive, based on patients' need and to the point. Information must be prepared by nurses with simplicity and credibility.^{13, 15, 16}

Lack of privacy was another important barrier faced by patients. In previous study, unsuitable environmental conditions are also one of main barriers to effective communication.¹⁰ Mendes et al revealed that lack of respect for privacy is one of the factors disturbing the communication process¹⁷

The study also revealed that anxiety, pain and physical discomfort of patient were some of the patient barriers to effective communication. Aghabarari et al clarified that complaints of patients like pain, fatigue, anxiety, stress are some factors which hinder health care communication.⁸ However nurse should consider the suffering of patients in an empathetic way and all the needs of patient must be managed.^{8, 18} Therefore it can be deduced from research that when the patients are suffering from pain, they do not feel comfortable to communicate.

One of the barrier perceived by patients was misinterpretation of words by nurse. This could be due to unfamiliarity with patient's colloquial language of nurse.¹⁹ The patients also had few problems with confidence in nurse. According to previous study, patients may not make most informed decisions in the care including refusal to some procedures or treatment if they cannot trust people providing care to them.²⁰

Other barriers which perceived relatively less troublesome in the list were reluctance to communicate, non-compliance to treatment, negative attitude of nurse and age and gender difference between patient and nurse.

Qualitative data analysis revealed some common environmental barriers to communication between nurse and patients.. such as unfamiliarity to hospital ward and staff, negative attitude of other patients, physical discomfort due to lack of proper facilities like lighting, ventilation, food etc. The thematic data analysis showed the ways to overcome the barriers of communication between nurse and patient and vice versa like more staff recruitment, hiring male nurses, provision of enough time to know the patient, patient's sensitization, orientation towards hospital environment, regular training of nurses on communication skills, strict protocol for patient care and effective feedback system for ensuring accountability etc depicted in the thematic Map. (Fig-3)

Based on the results and evidences the present study recommends few strategies to improve nurse-patient relationship through effective communication leading to better health outcome and patient satisfaction.

-Training program on communication skills for nurses.

-Decreasing nurses' workload through hiring more staff

-Provision of safe and comfortable environment though hospital administrative support.

-Dedicated hrs for patient sensitization, orientation to hospital environment also for nurses to know their patient & understand the disease.

- Patient centered approach and strict protocol for patient care

-Effective feedback system and accountability

-The target of training programs should be teaching the nurses to find enough time for explanation and proper persuasion of their patients. Finally cooperation must be taken from both sides: nurses and patients particularly to overcome misunderstanding^{7,12,21}

Conclusion

Among many prevalent barriers of communication, unpleasant experiences in past and use of medical jargons were the important one as perceived by nurses and patients respectively. Other perceived barriers were lack of time to communicate with patient, gender differences, lack of privacy of patients, anxiety, pain and physical discomfort of patients etc. These can be tackled by effective communication training of nurses, sensitization program for patients and increasing the nurses: patient ratio as suggested by the participants.

Limitations: Availability of only female nurses, small sample size of Patient

Source of Funding:Self

Conflict of Interest: Nil

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Resilience and Quality of Life of People living with HIV/AIDS. A Cross Sectional Study at ART centre, Bagalkot, Karnataka

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Abstract

Background: Resilience can be viewed as a defense mechanism that enables one to thrive amid distress. Therefore, improving resilience HIV infected people may be an important target for improving their quality of life.

Aims: The aim of the study was to assess the resilience and quality of life of People living with HIV/AIDS and find the relationship between them.

Methodology: The resilience and quality of life were measured using Brief Resilient Coping scale and WHOQOL-BREF scale respectively from a convenient sample of 100 People living with HIV/AIDS (PLHIV) attending ART centre, Bagalkot in a cross sectional survey. Data were analyzed using descriptive and inferential statistics.

Findings: Majority (66%) of PLHIV had moderate resilience, 53% of PLHIV had moderate overall quality of life. A statistically significant positive correlation was found between the resilience and environmental domain scores of QoL ($r_s=0.18$, $P<0.05$) and total QoL scores ($r_s=0.23$, $P<0.05$). A significant association was found between the resilience scores and clinical variable duration of treatment with ART ($\chi^2=10.56$, $p<0.05$) and there was a significant association between total quality of life scores and duration of HIV illness ($\chi^2=11.32$, $p<0.05$) and duration of treatment with ART ($\chi^2=11.38$, $p<0.05$).

Conclusion: Resilience has unconditional positive effect on all aspect of quality of life. PLHIV may benefit from intervention addressing their resilience.

Keywords: Resilience, Quality of Life, People Living with HIV/AIDS

Introduction

Human immunodeficiency virus (HIV) infection / Acquired immunodeficiency syndrome (AIDS) is one of the serious public health problems with severe impact on various facets of human life.¹ At present, in the world,

around 36.9 million people are suffering from HIV/AIDS.² Every year around 2 million people are infected by this virus.² With an HIV prevalence of 0.26% in the adult population, India has an estimated 2.1 million people living with HIV.³

In essence, being resilient means being able to adapt and bounce back when something difficult happens in our lives. It is the ability to once again pick ourselves up after a trauma or painful experience. Our levels of resiliency will change and develop throughout our live, and at points we will find that we do not cope as well as others, as well as surprising ourselves when we manage a difficult situation. In another sense, resilience is just one of many psychological tools we implement to get us

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back to feeling normal again.⁴

Resilience is important for a number of reasons; it enables us to develop mechanisms for protection against experiences which could be overwhelming, it helps us to maintain balance in our lives during difficult or stressful periods of time, and can also protect us from the development of some mental health difficulties and issues.⁴

Quality of life (QOL) is a term that is popularly used to convey an overall sense of well-being and includes aspects such as happiness and satisfaction with life as a whole.⁵ HIV and its treatments can affect many areas of health-related quality of life. Assessing the impact of HIV and its treatments on quality of life is complex. It takes a lot of effort to untangle the physical effects of the virus, and the drugs we take to make the virus less lethal, from the wider emotional and social impact that HIV can have on our lives.⁶

Better resilience in an individual may lead to improved coping, resulting in better quality of life of the sufferer.⁷ Although resilience has a positive impact on the Quality of life of adults; few published studies examine resilience among adults, particularly those living with HIV⁸. There is a need for a greater understanding of resilience in the context of HIV infection and its relation to quality of life of HIV infected people, which can help in the conceptualization of interventions to enhance the quality of life (QoL) in People living with HIV/AIDS. To address this gap, this research was undertaken to examine the relationship between the Resilience and Quality of Life of People living with HIV/AIDS at ART Centre, Bagalkot.

Material and Methods

Study Design and Participants

Present study was a descriptive cross sectional study conducted between Aug 2017 to Sep 2017. A convenient sample of 100 people living with HIV (PLHIV) coming for follow up counseling at ART Centre, District Government Hospital, Bagalkot were selected for the study. PLHIV who were between 18 to 50 years of age and willing to participate were included in the study. PLHIV who were positive for less than 2 weeks were excluded because the information from them was asked based on their last two weeks experience. PLHIV with severe opportunistic infection were also excluded from the study. Permission to conduct study was obtained

from Project Director, Karnataka State AIDS Prevention Society, Bangalore.

Instruments

Brief Resilient Coping Scale (BRCS)

Resilience among the PLHIV was measured using the Brief Resilient Coping Scale (BRCS)⁹, a 4 item 5 point Likert type of scale. Response options range from 1 to 5 for each item (1 = Does not describe me at all, 2 = Does not describe me, 3 = Neutral, 4 = Describes me, 5 = Describes me very well). Scores range from 4 to 20, with high scores indicating high resilience interpreted as; Low resilient copers (4-13 points), Medium resilient copers (14- 16 points) and High resilient copers (17- 20). Scale was translated to Kannada and then back translated to English. High internal consistency has been reported with Cronbach's alpha coefficients ranging from 0.81 to 0.82 across studies¹⁰. For the present study reliability was calculated by administering BRCS to 10 PLHIV and Cronbach's alpha coefficient obtained was 0.80.

Quality of Life (WHO Quality of Life – HIV BREF)

Quality of life was measured using the World Health Organization (WHO) Quality of Life (QOL) short version (WHOQOL- BREF)¹¹, a 26-item scale that assesses the quality of life of PLHIV in four domains: physical health, psychological, social relationships, environment. Apart from the items included in four domains, two items (Q1 and Q2) were examined separately, one is about the individual's overall perception of QOL and the other is about the individual's overall perception of his or her health. All items are answered on a 1 to 5 response scale. Negatively worded items were reverse coded. The mean score of items within each domain is used to calculate the domain scores. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100.¹¹ Overall scores range between 26 (minimum) and 130 (maximum), hence higher the score, better the quality of life. Scale was translated to Kannada and then back translated to English. Cronbach's α of 0.88 was obtained by administering the scale to 10 PLHIV.

Socio-demographic Variables and Clinical characteristics

Socio-demographic and clinical variables included Age, Sex, Religion, Educational Status, Occupational

Status, Marital Status, Income, Type of Family, Area of residence, Social support, Duration of time with HIV/AIDS, Duration of time on ART, CD4 count, HIV status of spouse, Mode of HIV transmission, adherence to ART.

Data Collection Procedures

Prior permissions were taken from relevant institutions before the beginning of data collection procedure. The study participants were indentified during the study period at ART centre, District Government Hospital, Bagalkot. Every HIV infected person who fulfilled the inclusion criteria was approached for data collection. Consent was obtained by the interviewers before participants underwent the structured interview which lasted approximately for 15 to 20 minutes. Purpose of the study was explained to the participants and they were interviewed in Kannada or in the language understandable to them. All the information collected was based on patient's self report, but the information related to CD4 count was obtained from the medical records.

Data Analysis

Descriptive univariate statistics such as frequencies and percentages were used for categorical variables. Correlation between resilience and QoL was assed using Spearman's Rank Order correlation coefficient. Association between the socio-demographic and clinical

characteristics with resilience and QoL was found using Chi-Square test.

Results

A: Sample characteristics

PLHIV were equally distributed in all the age groups with highest being in 35-40 years (19%). 51% of the PLHIV were males and majority of them were Hindus (76%). Most of the PLHIV had no formal education (61%). PLHIV were spread out in variety of occupations with highest being laborers (27%). 27% of the PLHIV were separated from their spouses. Majority of the PLHIV (67%) had monthly family income less than Rs.5000/-. Most of the PLHIV (67%) were belonging to nuclear family. 54% of the PLHIV were residing in the urban areas. High number of PLHIV (35 %) have been suffering from HIV for 5 years or more than 5 years and 35% of them have been receiving ART for 5 years or more than 5 years. High percentage of PLHIV's CD4 count range between 401-550 cells and 72% of the PLHIV had HIV positive spouse. Majority of the PLHIV (71%) infected with HIV through heterosexual contact. Most of the PLHIV (76%) were taking ART regularly.

B: Assessment of Resilience of PLHIV

Findings reveal that majority of the PLHIV (66%) had medium resilience, 30 % of the PLHIV had low resilience and only 4% of the PLHIV had high resilience (Table 1)

Table 1: Levels of resilience of PLHIV

Levels of resilience	Range of score	Frequency	Percentage (%)
Low Resilient	4-13	30	30
Medium Resilient	14-16	66	66
High Resilient	17-20	4	4

C: Assessment of Resilience Quality of Life of PLHIV

Results of the study show that majority (82%) of the PLHIV had poor quality of life and remaining 18% of the PLHIV had good quality of life (Table 2).

Table 2: Levels of Quality of Life

Levels of Quality of Life	Range of score	Frequency	Percentage (%)
Good Quality of Life	>65	18	18
Poor Quality of Life	<65	82	82

D: Correlation between Resilience and Quality of life of PLHIV

Correlation analysis shows that there was a significant positive correlation between and resilience and total quality of life and environmental domain of quality of life (Table 3).

Table 3: Correlation between Resilience and Quality of Life of PLHIV

Domains of QoL	Correlation Coefficient (r)
Over all QoL	0.0144
Physical Health	0.19
Psychological	0.16
Social relationship	0.17
Environmental	0.18*
Total	0.23*

*P<0.05

E: Association between Resilience and Socio-demographic and clinical variables of PLHIV

Finding related to association between the resilience and socio-demographic and clinical characteristics of PLHIV reveal that there was a significant association between the resilience and variable duration of time on ART (Table 4).

Table 4: Association between Resilience and Socio-demographic and clinical variables of PLHIV

Sl. No.	Socio demographic & clinical variables	Df	Chi-square value
1	Age	4	6.67
2	Sex	1	0.03
3	Religion	2	0.68
4	Educational Status	3	3.21
5	Occupational Status	3	2.21
6	Marital Status	3	7.43
7	Monthly Income of Family	2	2.84
8	Type of Family	2	0.41
9	Area of residence	1	0.13
10	Support system	2	0.92
11	Duration of time with HIV/AIDS	3	6.04
12	Duration of time on ART	3	10.56 *
13	CD4 count	2	2.23
14	HIV status of spouse	2	4.24
15	Mode of HIV transmission	3	4.44
16	ART adherence	2	3.33

*P<0.05

F: Association between QoL and Socio-demographic and clinical variables of PLHIV

Finding related to association between the QoL and socio-demographic and clinical characteristics of PLHIV reveal that there was a significant association between QoL and variables duration of time with HIV/AIDS and duration of time on ART (Table 5).

Table 5: Association between QoL and Socio-demographic and clinical variables of PLHIV

Sl. No.	Socio demographic & clinical variables	Df	Chi-square value
1	Age	4	5.88
2	Sex	1	0.01
3	Religion	2	0.86
4	Educational Status	3	5.18
5	Occupational Status	3	3.43
6	Marital Status	3	6.62
7	Monthly Income of Family	2	5.42
8	Type of Family	2	0.23
9	Area of residence	1	0.08
10	Support system	2	0.13
11	Duration of time with HIV/AIDS	3	11.32*
12	Duration of time on ART	3	11.38 *
13	CD4 count	2	2.86
14	HIV status of spouse	2	3.94
15	Mode of HIV transmission	3	4.12
16	ART adherence	2	3.89

*P<0.05

Discussion

The main objective of the present study was to find the relationship between the resilience and quality of life people living with HIV/AIDS. This cross sectional study included a sample of 100 PLHIV attending the ART centre, District Government Hospital, Bagalkot. Findings revealed that, Majority (66%) of PLHIV had moderate resilience and 53% of PLHIV had moderate overall quality of life. Despite of having stressful life the people with HIV/AIDS had managed to show the better resilience that has contributed to their quality of life.¹²

A statistically significant positive correlation was found between the resilience and environmental domain scores of QoL ($r_s=0.18$, $P<0.05$) and total QoL scores ($r_s=0.23$, $P<0.05$). Similar findings were found in the study conducted by Yadav S (2010) to assess the relationship between Hope and QOL of PLHIV in Nepal. A positive correlation was found between hope and all domains of quality of life but hope was a stronger predictor for the environmental functioning ($r=.445$, $p=.000$) than the other domains of the quality of life.¹³

A significant association was found between the resilience scores and clinical variable duration of treatment with ART ($\chi^2=10.56$, $p<0.05$) and there was a significant association between total quality of life scores and duration of HIV illness ($\chi^2=11.32$, $p<0.05$) and duration of treatment with ART ($\chi^2=11.38$, $p<0.05$). Similar findings were found in the studies conducted to assess the resilience and quality of life in people living with HIV and their associated factors, where a longer time since diagnosis of HIV illness was significantly associated with resilience and quality of life of PLHIV.^{14,15}

Limitations

Although present study has able to explain to some extent the relationship between resilience and quality of life of PLHIV, some limitations need to be taken into account. Sample size was limited to 100 PLHIV, hence the results cannot be generalized to wider population. Limited variables were included in this, as other aspects like co morbidity, medication adherence, viral load, anxiety and other psychosocial correlates like stigma, social support system could be also associated with resilience and QoL of PLHIV. Hence further researches may consider these limitations to update the knowledge on resilience and QoL.

Recommendations

Interventions should be aimed at improving the resilience among PLHIV at ART centers as it has been shown that higher the resilience and better will be the QoL. Community-based workers and health professionals should provide education to PLHIV regarding techniques of improving their resilience so that their quality of life could be improved.

Conclusions

The study is helpful to find the relationship between the resilience and quality of life people living with HIV/AIDS. A positive correlation between the resilience and quality of life of PLHIV suggests that interventions focusing to enhance the resilience of PLHIV would contribute to the improvement of their quality of life. Future researches can investigate the effect of various psychological measures to improve the resilience in PLHIV with the aim of improving their overall quality of life.

Ethical Clearance: Ethical clearance was obtained from the institutional ethical committee of BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

Source of Funding: Self

Conflict of Interest: Nil

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Evaluation of Levels of Estrogen and Progesterone Hormones in Women with Preeclampsia

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Abstract

Introduction: Preeclampsia was defined as new onset hypertension after 20 weeks' gestation such that systolic blood pressure of ≥ 140 mm Hg, diastolic pressure of ≥ 90 mm Hg or both were measured on two occasions ≥ 6 hours apart, with significant proteinuria (300 mg/24 h). Preeclampsia is a transient but potentially dangerous complication of pregnancy that affects 3 to 5 percent of pregnant women.

Aims and Objectives: To study the comparison of estrogen and progesterone levels in women with preeclampsia and without preeclampsia.

Material and Method: The present study was conducted in the department of biochemistry in collaboration with department of gynaecology in MMIMSR, MMDU Mullana, Ambala. 100 pregnant women visiting in MM superspeciality hospital were considered in our study. They were divided into 2 groups. Group I included 50 hypertensive pregnant women and Group II included 50 healthy pregnant women.

Biochemical investigation: Estimation of Serum 17- β E₂ (estradiol) and Progesterone were done by ELISA Method.

Results: The mean Estradiol level were significantly lower ($P < 0.001$) in study group (36.1 ± 6.9) than in control group (64.8 ± 8.2) and Progesterone levels were significantly lower ($p = 0.01$) in the study group (77.3 ± 10.4) than in control group (113.7 ± 11.38).

Conclusion: Levels of Estrogen and progesterone were pathologically and significantly lower in preeclamptic cases than control women with similar age, gestational age and body mass index. This difference indicates a role of progesterone and estrogen in the pathogenesis of preeclampsia. Therefore estrogen and progesterone levels should be evaluated in all pregnant women so as to manage these patients timely and prevent preeclampsia.

Keywords: Preeclampsia, Estradiol, Progesterone

Introduction

Preeclampsia is defined as a pregnancy related syndrome occurring after 20th week of pregnancy with systolic blood pressure > 140 mmHg or diastolic blood pressure > 90 mmHg associated with significant

proteinuria (> 300 mmHg) in a previously normotensive woman.^[1] It complicates at least 10% pregnancies.

About 12% of preeclampsia occurs before 34 weeks of gestation and that is the reason delivery due to preeclampsia results in pre-term birth. Preeclampsia may result in intra-uterine growth retardation, preterm birth, perinatal death, antepartum and postpartum haemorrhage, acute hepatic, renal failure and maternal death.^[2] Hypertensive disorders associated with preeclampsia are important factor of severe morbidity, disability and death among mother, fetus and neonates.^[3]

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In early pregnancy, progesterone, estrogen and their metabolites participate in placental angiogenesis and in normal trophoblast development and invasion. Estradiol alters concentrations of the angiogenic markers VEGF, PIGF and s-FLT [4,5,6] which regulate angiogenic processes. It has been hypothesized that low levels of estradiol may lead to insufficient trophoblast development of angiogenesis, termed the estrogen deficiency hypothesis. Subsequently low levels of estradiol may persist throughout pregnancy due to the impaired implantation, once the shift to placental metabolism of this hormone occurs, thus explaining the reduced estrogen values that are sometimes observed in preeclampsia.^[4] But while fall in urinary estriol excretion was once considered a harbinger of preeclampsia.^[7,8,9]

Aims and Objectives

To study the comparison of estrogen and progesterone levels in women with preeclampsia and without preeclampsia.

Material and Methods

This study was conducted in the department of biochemistry in collaboration with department of gynaecology in MMIMSR, MMDU Mullana, Ambala. 100 pregnant women visiting in MM superspeciality hospital were considered in our study. They were divided into two groups. Group I included 50 hypertensive pregnant women and Group II included 50 healthy pregnant women.

Exclusion Criteria

Pre-existing renal disease, thyroid disease, diabetes mellitus, pre-existing thrombo- cytopenia and

hepatocellular damage excluded from the study.

Sample Collection:

5 ml of venous blood sample will be collected from anti - cubital vein of the subjects in a disposable syringe under aseptic conditions and transferred to a sterile, dry and acid washed vial for biochemical analysis. The blood will be allowed to stand for half an hour. After the clot formation, the supernatant will be centrifuged to perform the biochemical investigations.

Biochemical Investigations:

17-β E₂ (Estradiol)^[10] and Progesterone^[11] were done by ELISA method.

Statistical Analysis

All the data were analyzed by using the SPSS version 20. Values were presented as Mean ± standard deviation (SD). To test the significance between the study group and the control groups' analysis was done by a student's t- test. The p-value (p <0.05) was significant.

Results

A total of 100 patients were accepted to this study. The mean maternal age, mean gestational age and body mass index were not significantly different (p > 0.5) between the study group and control group in Table 1. Serum hormone concentrations are presented in Table 2. The mean Estradiol level were significantly lower (P<0.001) in study group (36.1±6.9) than in control group (64.8±8.2). The mean Progesterone levels were significantly lower (p=0.01) in the study group (77.3 ± 10.4) than in control group (113.7 ± 11.38).

Table 1: Demographic features of pregnant women with Preeclampsia and without Preeclampsia

Data of study	Study group	Control group	Significant
Age	27.3 ± 2.8	24.3 ± 2.1	NS
BMI (kg/m ²)	13.12 ± 6.12	13.05 ± 5.8	NS
Estimated gestational age (weeks)	35.9 ± 0.6	36.6 ± 0.9	NS

Table 2: Serum hormones concentration in women with preeclampsia and without preeclampsia

Data of study	Study group	Control group	p value	Significant
Estradiol (E2)	36.1±6.9	64.8±8.2	0.001	HS
Progesterone	77.3 ± 10.4	113.7 ± 11.38	0.01	S

Discussion

In present study levels of progesterone and estradiol were found to be significantly lower in women with preeclampsia than in normotensive women with similar body mass index, gestational age and maternal age. (Table 2). In a study progesterone was considered as main steroid hormone with major action on vascular tension during pregnancy.^[12] Because progesterone injection in induced preeclampsia of rats resulted in reduction of blood pressure.^[13] Also progesterone administration in pregnancy induced hypertension leading to significant decrease in both systolic and diastolytic blood pressures, significant increase in urinary output, amelioration of the edema, slight reduction in weight gain, but no change in the proteinuria.^[14] Our findings about progesterone levels are compatible with results of these studies. In a study conducted by Belfort on isolated human artery from premenopausal non-pregnant women and from normotensive and preeclamptic pregnant women, it was established progesterone have direct in vitro activity in human omental artery from normal and hypertensive women in different hormonal states.^[15]

Alterations in vascular sensitivity of endogen hormones (angiotension II, catecholamin and vasopressin) and absence or decrease of nitric oxide concentration may have an important role in the increase of blood pressure, which were observed in preeclampsia.^[16,17] In preeclampsia the thromboxane (vasoconstrictor) A2 / prostacyclin ratio has been found to be increased.^[17] Progesterone vascular relaxant effect probably is able to ameliorate these effects. Progesterone's vascular relaxant effect may depend on the release of the prostacycline or the nitrite oxide.^[18] Other important mechanism for progesterone antihypertensive character is direct effect on vascular muscles by blocking of calcium channels.^[19]

Conclusion

Levels of estrogen and progesterone were pathologically and significantly lower in preeclamptic cases than control women with similar age, gestational age and body mass index. This difference indicates a role of progesterone and estrogen in the pathogenesis of preeclampsia. During pregnancy, estrogen is produced primarily in the placenta by conversion of androgen precursors originating from maternal and fetal adrenal glands. These processes lead to increased plasma estrogen concentrations compared with levels in nonpregnant women. Aberrant production of estrogens could play a key role in Preeclampsia symptoms because they are exclusively produced by the placenta and they promote angiogenesis and vasodilation. Therefore estrogen and progesterone levels should be evaluated in all pregnant women so as to manage these patients timely and prevent preeclampsia.

Source of Funding: Self

Conflict of Interest: Nil

Ethical Clearance: Taken

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Lowest Deficiency of Vitamin D & Vitamin B12 in Indian Old Population and Postmenopausal Women

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Abstract

Background: The present study compared the prevalence of deficiency of these components in various groups of Indian population.

Methods: The serum concentrations for vitamin D, iron, vitamin B12, cholesterol and calcium were determined by an automated analyzer with the use of commercial kits.

Results: Vitamin D and vitamin B12 deficiency was significantly higher in young population in comparison to older age group. Older age groups were found to have low cholesterol levels, high vitamin D and vitamin B12 levels when compared with other age groups. Female infants have lower prevalence of vitamin D deficiency and high prevalence of vitamin B12 and iron deficiency when compared with male infants. Female adults and young population showed significantly low levels of iron in comparison to age matched males. Premenopausal women had significantly low levels and high prevalence of deficiency vitamin D and vitamin B12 in comparison to postmenopausal women.

Conclusion: This study recommend supplementation of multivitamins to all pre-menopausal women and breast fed infants regardless of being given formula feeds. This study also showed that prevalence of deficiency of these components changes within various age groups and young population is at high risk of vitamin deficiency.

Keywords: *Vitamin D, Age, Vitamin B12, Calcium, Iron, Menopause*

Introduction

Vitamin D plays an important role in calcium and phosphate resorption, bone health and mineralization⁽¹⁾. Very few Indian studies have been published on the consequences of Vitamin D deficiency (VDD) leading to availability of most of the data from overseas studies.

Iron in particular is involved in many physiological processes, particularly in the production of red blood cells and myoglobin^(2, 3). Therefore, the lack of this mineral is associated with iron deficient anemia (IDA). Although IDA occurs at all age and involves both the

sexes⁽⁴⁾, there is a paucity of data about the age and sex wise epidemiology of anaemia in Indian population.

Indian population is more sensitive to vitamin B12 deficiency due to vegetarian food habit⁽⁵⁾. Deficient is related with irreversible and potentially severe diseases and eventual growth problems if the deficiency is left untreated. However, data documenting age and sex wise status of vitamin B12 deficiency in India in general population is limited.

Hypercholesterolemia is very common among Asian population and it could be due to genetic risk, lifestyle factors, and suboptimal dietary habits. The likelihood of dying from cardiovascular diseases in young people doubles with every 40 point increase in total cholesterol. Although several reports and reviews documented the increasing prevalence of high cholesterol, and declining smoking rates among the educated Indians⁽⁶⁾. All of these

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evaluations have multiple biases such as compilation of several studies from different sources and different methodologies⁽⁷⁾.

In the present study, we evaluated the age and sex wise concentrations and prevalence of deficiency of vitamin D, vitamin B12, calcium, iron and cholesterol in Indian population, pre-menopausal and postmenopausal women. This study fills lacuna in literature and presents prevalence of deficiency of these components in Indian general population.

Materials and Methods

Population: In the present study levels of vitamin D, cholesterol, calcium, vitamin B12, and iron was estimated in Indian population (2018 January-2019 December). Patients were categorized into 5 groups i) Infants (0-2 years) ii) children (3-12 years) iii) Teenager (13-18) iv) Young (19-35) v) adult (36-65) and vi) old (>65). Table 1 describe the number of patients in each group and demonstrate the normal range of each component. Individuals who came only for their normal routine check-up and ready to be the part of this study was only included.

Blood samples were collected from all the patients by taking aseptic precautions and transferred to serum vials. Once the blood is clotted, all the samples were centrifuged for 3000 RPM (revolutions per minute) for 5 minutes. The serum concentrations for vitamin D, iron, vitamin B12, cholesterol and calcium were determined by an automated analyzer (CX 9; Beckman, Brea, CA) with the use of commercial kits (Beckman coulter, CA).

Results

Lowest prevalence of vitamin D deficiency in older population

The mean 25(OH)-D concentration of the study group was 25.40 ± 13.20 ng/ml. Overall, 71% of the study population were defined as having vitamin D deficiency. Old population (>65 years age) had highest vitamin D levels and low vitamin D deficiency than children, teenager, young and adult population except infants. The prevalence of vitamin D deficiency was highest in children and young groups (78%) (Table 2).

Next comparison was done in between males and females of each group. Female adults have significantly higher vitamin D concentration than age matched males (Table 2). No significant difference in vitamin D concentration was found in males and females of other age groups.

Lowest prevalence of vitamin B12 deficiency in older population

47% of the population showed vitamin B12 deficiency. The mean concentration of vitamin B12 was 270 ± 242 . The prevalence of vitamin B12 deficiency was lowest in older population and highest in young group. Similar trend was seen in vitamin B12 concentration. Old population had significantly high vitamin B12 levels and low vitamin B12 deficiency than other groups. Whereas, female teenagers and adults have significantly high vitamin B12 levels in comparison to age matched males. This data showed that female adults have significantly high vitamin D and vitamin B12 levels when compared with age matched males (Table3).

Highest prevalence of iron deficiency in old population

71% of old males showed significantly high prevalence of iron deficiency. Similarly female infants showed low iron levels and high prevalence of iron deficiency when compared with males. Female adults (55 ± 37) and young population (57 ± 43) showed significantly low levels of iron in comparison to age matched males (adults: 81 ± 54 , $p=0.0007$ and young: 80 ± 33 , $p=0.006$). No significant difference was observed in calcium levels among all the groups (Table 4).

Highest cholesterol level in Adults

25% of population showed high cholesterol level (≥ 200 mg/dl). Whereas we did not get any sample for infants and children group, all teenagers were having normal cholesterol levels. 31% of adults showed highest cholesterol levels in comparison to 18% of older population ($p=0.04$). Similarly mean concentration of cholesterol was highest in adults (183 ± 43 ; $p<0.05$) in comparison to teenagers. No significant difference was observed in other groups. Young females (48%) showed high prevalence of cholesterol when compared with age matched males (28%; $p=0.0005$) (Table 5).

Status of vitamin D, vitamin 12, iron, cholesterol and calcium in pre and postmenopausal women

Premenopausal women had significantly low levels and high prevalence of deficiency vitamin D and vitamin B12 in comparison to postmenopausal women. No significant difference was observed in iron, calcium and cholesterol levels (Table 6).

Table 1: Total number of individuals in each age group and Normal range of each component

	Infants (N)	Child (N)	Teenager (N)	Young (N)	Adults (N)	Old (N)	Total
Vitamin D (ng/ml)	131	155	139	1482	2100	227	1423
Vitamin B12 (pg/ml)	60	51	139	1748	3138	472	5608
Iron (ug/dL)	27	10	9	121	148	26	341
Calcium (mg/dl)	96	63	62	360	498	40	1119
Cholesterol (mg/dl)	0	0	14	199	527	53	793
	Normal laboratory range as per the manufacturer recommendation						
Vitamin D (ng/ml)	30-100 ng/ml						
Cholesterol (mg/dl)	125-199 mg/dl						
Vitamin B12 (pg/ml)	190-950 pg/ml						
Calcium (mg/dl)	8.5-10.5 mg/dl						
Iron (ug/dL)	Child 50-120µg/dl, Male 65-175µg/dl, Female 50-170µg/dl						

Table 2: Age and sex-wise distribution of vitamin D levels and deficiency in Indian population

	Infants	Child	Teenager	Young	Adults	Old			
Vitamin D (ng/ml)	27.99±21.37 (N=131)	22.94±15.09 (N=155)	22.66±13.58 (N=139)	23.06±12.52 (N=1482)	25.86±15.64 (N=2100)	29.93±19.61 (N=227)			
Deficiency of vitamin D (% population)									
Vitamin D	70	78	75	78	69	59			
Vit. D (ng/ml)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	25.40±22.64 (N=60)	30.10±20.03 (N=71)	0.21	24.74±19.15 (N=64)	21.68±11.24 (N=91)	0.21	24.11±15.6 (N=41)	21.98±12.64 (N=98)	0.40
	Young			Adult			Old		
23.91±12 (N=453)	22.69±12 (N=1029)	0.07	23.66±14 (N=754)	26.46±15 (N=1346)	0.0001	28.07±13 (N=138)	32.79±25 (N=89)	0.06	
Deficiency of vitamin D (% population)									
Deficiency of vit D (% population)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	76	62	0.03	73	81	0.09	70	73	0.75
	Young			Adult			Old		
76	79	0.73	75	68	0.34	62	53	0.25	

Table 3: Age and sex wise distribution of vitamin B12 levels and deficiency in Indian population

	Infants		Child	Teenager	Young	Adults	Old		
Vitamin B12 (pg/ml)	296±279 (N=60)		238±149 (N=51)	234±186 (N=139)	201±172 (N=1748)	257±245 (N=3138)	394±421 (N=472)		
Deficiency of vitamin B12 (% population)									
Vitamin B12	40	52	50	60	50	32			
Vit. B12 (pg/ml)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	393±335 (N=26)	210±145 (N=34)	0.005	240±141 (N=19)	237±154 (N=32)	0.94	177±82 (N=37)	254±207 (N=102)	0.03
	Young			Adult			Old		
193±157 (N=723)	208±182 (N=1025)	0.07	230±227 (N=1327)	277±256 (N=1811)	0.0001	375±398 (N=265)	425±456 (N=199)	0.21	
Deficiency of vitamin B12 (% population)									
Deficiency of vit B12 (% population)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	30	48	0.01	43	56	0.07	59	47	0.12
	Young			Adult			Old		
62	58	0.66	55	45	0.16	34	30	0.54	

Table 4: Age and sex wise distribution of iron and calcium levels and deficiency in Indian population

Iron (ug/dL)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	62±63 (N=14)	37±16 (N=13)	0.17	61±50 (N=5)	33±18 (N=5)	0.27	27.6±6.4 (N=2)	56±42 (N=7)	0.39
Young			Adult			Old			
80±33 (N=33)	57±43 (N=88)	0.006	81±54 (N=57)	55±37 (N=91)	0.0007	67±58 (N=14)	67±58 (N=12)	1.0	
Deficiency of iron (% population)									
Deficiency of iron (% population)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	78	100	0.0001	60	66	0.46	100	57	Not comparable due to n=2 in males
	Young			Adult			Old		
36	48	0.11	43	56	0.08	71	50	0.0003	
Deficiency of calcium (% population)									
Calcium (mg/dl)	Infants		Child	Teenager	Young	Adults	Old		
	8.8±1.4 (N=96)	9±0.86 (N=63)	8.9±0.8 (N=62)	9±0.9 (N=360)	8.9±0.83 (N=498)	9.1±1.1 (N=40)			
Calcium	21	19	27	21	20	20			
Calcium (mg/dL)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	8.6±1.2 (N=64)	9.1±1.7 (N=32)	0.09	8.9±0.8 (N=32)	9.1±0.8 (N=31)	0.35	8.8±0.85 (N=18)	8.9±0.84 (N=44)	0.67
	Young			Adult			Old		
9.1±0.98 (N=97)	8.8±0.83 (N=263)	0.004	8.8±0.86 (N=150)	8.9±0.80 (N=348)	0.2	9±1.02 (N=18)	9.2±1.1 (N=22)	0.56	
Deficiency of calcium (% population)									
Deficiency of calcium (% population)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	26	16	0.11	18	19	1.0	33	25	0.27
	Young			Adult			Old		
16	23	0.28	22	20	0.86	22	18	0.59	

Table 5: Age and sex-wise tabular representation of cholesterol levels in Indian population

High cholesterol (% population)									
Cholesterol (% population)			Young			Adult		Old	
			25			31		18	
		Infants	Child		Teenager	Young		Adults	Old
Cholesterol (mg/dl)		NA	NA		148±23 (N=14)	178±39 (N=199)		183±43 (N=527)	168±62 (N=53)
Cholesterol (mg/dl)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	8.6±1.2 (N=64)	9.1±1.7 (N=32)	0.09	8.9±0.8 6 (N=32)	9.1±0.8 6 (N=31)	0.35	8.8±0.85 (N=18)	8.9±0.8 4 (N=44)	0.67
	Young			Adult			Old		
9.1±0.9 8 (N=97)	8.8±0.8 3 (N=263)	0.004	8.8±0.8 6 (N=150)	8.9±0.8 0 (N=348)	0.2	9±1.02 (N=18)	9.2±1.1 (N=22)	0.56	
High cholesterol (% population)									
High cholesterol (% population)	Infants			Child			Teenagers		
	Male	Female	p-Value	Male	Female	p-Value	Male	Female	p-Value
	NA	NA		NA	NA		0	0	
	Young			Adult			Old		
28	48	0.0005	28	34	0.44	20	17	0.71	

Table 6: Status of vitamin D, B12, Iron, calcium and cholesterol in pre and postmenopausal women

	Pre-menopausal women (>18 and <40)	Post-menopausal women (>55)	p-value	Pre-menopausal women (>18 and <40)	Post-menopausal women (>55)	p-value
	Level			Prevalence of deficiency (%)		
Vitamin D (ng/ml)	23±12 (n=1250)	30± 21 (n=435)	0.0001	78	57	0.0015
Vitamin B12 (pg/ml)	213±179 (n=1456)	354±350 (n=661)	0.0001	58	38	0.0046
Calcium (mg/dl)	8.8±0.83 (n=335)	9.0±0.91 (n=76)	0.063	24	19	0.38
Iron (ug/dL)	56±42 (n=114)	56±44 (n=39)	1.0	51	59	0.26
	High cholesterol (%)			High cholesterol (%)		
Cholesterol (mg/dl)	23			31		P=0.20

Discussion

The community-based Indian studies of healthy controls reported a prevalence of VDD ranging from 50% to 94%. Estimated prevalence of vitamin D deficiency in 71% population agrees with the current understanding of

status of Indian population.

Age dependent increasing prevalence of vitamin D deficiency has been reported by many studies^(8, 9). However, in the current study, prevalence was particularly low in old population and adults. Moreover,

>70% of teenagers, children and a young age were deficient of vitamin D. Many factors such as amount of sun exposure and vitamin D supplements could be a possible factor. Children, teenagers and young people spend most of their times indoors either due to education or work in India in contrast to elderly.

There is evidence that a deficit in iron may disturb the synthesis of vitamin D₃ and lead to its mild deficiency. Out of the 27 children enrolled in the study 89 % were deficient in iron levels (<50 µg/dl). Iron deficiency during pregnancy and exclusive dependency of infants on breast feeding could be the leading causes of anaemia in infants and young children. In spite of the recommendation of iron and folic acid by Indian Government, the implementation of the programme is poor due to lack of logistic planning and liability⁽¹⁰⁾. Our results are in agreement with other Indian studies⁽¹¹⁾ and indicate that the iron supplementation programme for children aged ≤24 months should be better monitored with more focus on female infants.

In a recent study adults have been shown to have higher risk of Vitamin B12 deficiency⁽¹²⁾. However, in our study lowest prevalence of vitamin B12 deficiency in adults and highest prevalence in infants is seen. This could be again due to complete dependency of infants on breast feeding. Human breast milk contains low levels of vitamins and therefore, supplementation of multivitamins to all breast fed infants is necessary regardless of being given formula feeds.

Increasing trend of cardiovascular diseases due to high cholesterol is very common in India in contrast to developed countries where the incidence has decreased⁽¹³⁾. In our study 25% of the population have high cholesterol level and adults are having highest cholesterol levels in comparison to young and old population. However, we have not estimated levels LDL, HDL and triglycerides.

Whereas several studies have reported vitamin D inadequacy in post-menopausal women, we have found a higher proportion of vitamin-D-inadequacy in pre-menopausal women. This study suggests that pre-menopausal Indian women should be supplemented with multivitamins.

The strengths of this study are the large study population of all the age groups and comparison between males and females of age matched population. However, limitations include information about dietary intake of vitamin D, vitamin b12, iron, calcium and cholesterol, the amount of sun exposure, the amount of time spent outdoors, the use of sun-screen, and seasonal variation is lacking. All of these factors could affect the levels of these components.

Statement of ethics and disclosure statement: All the subjects have given their informed consent.

Conflict of Interest: None

Source of Funding: Self

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Prosthetic Rehabilitation of Hypoplastic Type of Amelogenesis Imperfecta Using Semi Permanent Crowns – A Case Report

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Abstract

Amelogenesis imperfecta (AI) is a group of tooth developmental disorder which has genetic causes otherwise referred to as hereditary dysplasia, in the absence of systemic disorders. It affects both deciduous and permanent dentition. The common problems associated with amelogenesis imperfecta (AI) is the risk of wear of the tooth enamel and dental caries susceptibility. This clinical report describes esthetic and functional prosthetic rehabilitation of hypoplastic type of Amelogenesis Imperfecta in a 13-year-old female patient with generalised sensitivity in all her teeth, yellow-brown discolouration and wearing of the posterior teeth. On clinical and radiographic examination, it was identified as hypoplastic type of Amelogenesis imperfecta according to Witkop's classification of AI. Prosthetic rehabilitation using semi permanent restoration for permanent posterior teeth was performed quadrant wise in four appointments with minimally invasive crown preparations and followed up at three months.

Keywords: *Stainless steel crowns, Hypoplastic, Amelogenesis Imperfecta, Deciduous Dentition, Permanent Dentition*

Introduction

Amelogenesis imperfecta (AI) is a hereditary enamel defect. It is inherited either as an autosomal dominant or recessive, or X-linked disorder of the teeth.¹ Several variants of Amelogenesis Imperfecta are seen based on clinical, radiographic, genetic, and histological findings. The prevalence of AI varies from 1 in 718 to 1 in 14000 live births depending on the population studied.² Transmission of the gene takes place either by autosomal, dominant X-linked, or recessive modes. The pathogenesis of AI occurs during the secretory stage of amelogenesis. In amelogenesis, enamel matrix proteins like amelogenin, enamelin and ameloblastin are secreted by enamel forming cells which play an important role in enamel crystal growth.

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According to literature, mutations of amelogenin gene (AMELX) causes X-linked AI and enamelin gene (ENAM) causes autosomal dominant type of AI.³ One of the most common classification of AI was introduced by Witkop in 1988. Classification of Amelogenesis Imperfecta includes four main types: hypoplastic (type I), hypomaturation (type II), hypocalcification (type III), and hypomaturation-hypoplasia with taurodontism (type IV) with fourteen subtypes.⁴ It shows a wide range of characteristics generally affecting nearly all of the teeth in primary as well as in permanent dentition.⁵

The most common and frequent clinical characteristic features of hypoplastic type of Amelogenesis imperfecta includes loss of enamel in occlusal and proximal surfaces with yellow-brown discolouration, glossy, smooth or rough surface, loss of proximal contact with the adjacent teeth, attrited occlusal surface of posterior teeth, square-shaped crown, and with grooves/pitting of buccal and lingual/palatal surface.¹ AI has also been associated with abnormal dental formation and eruption, congenital absence of teeth, anterior open bite, pulpal calcification, taurodontism, abnormal formation of roots, dentin dysplasia, crown and root resorption, excess cementum deposition. About 50 percent of population has the incidence of anterior open bite.⁶ Treatment

should be aimed at relieving the dentin hypersensitivity, restoring the vertical dimension, to preserve the natural tooth structure and to maintain occlusion. This results in improving the psychological health of the patient.

Patient's cooperation is important in managing the AI, as it needs multiple treatment phases, which would last for several years. In this case report, we present a case of management of hypoplastic type of Amelogenesis Imperfecta in a 9-year-old female patient via prosthetic rehabilitation

Case Report

A 13-year-old, female patient was reported to the OP, Department of Pedodontics and Preventive Dentistry with the chief complaint of generalised sensitivity in all her teeth, presence of yellowish coloured teeth which was chipping off while chewing hard food and the patient felt it was aesthetically unpleasing. Patient's familial history revealed that no other member in the family had this change. The patient's medical history was non-contributory. Following this, clinical examination was done which showed that the enamel layer of the teeth was very thin and yellowish brown in colour. It showed generalised wear of the posterior teeth and dentin was hypersensitive. Teeth showed diffuse pitting on the buccal surfaces (Figure 1,2). On evaluating the oral hygiene of the patient using OHI-S index, patient had chronic generalized gingivitis. Radiographically, it showed that all the teeth showed loss of tooth structure, on occlusal and proximal surfaces. After clinical and radiographic examination and exclusion of other possible conditions, this condition was diagnosed as hypoplastic type of Amelogenesis Imperfecta.

An appropriate treatment plan was made with an objective to restore the esthetics of the patient, to prevent further loss of tooth structure and to reduce dentin hypersensitivity. After explaining the treatment schedule and the length of the time period, informed consent was obtained from the parent. After considering the factors such as age of the patient, socioeconomic status, all the possible treatment options to restore the teeth, it was decided to place semi-permanent crowns like Stainless steel crowns (3M™ ESPE™) to restore the permanent first and second molars in all the four quadrants and jacket crowns to restore the anterior teeth. Patient was not willing for restoration of anterior crowns, so we decided to restore only the permanent first

and second molars, each quadrant per day.

In the first visit, oral prophylaxis was done. After local anaesthetic administration, preformed stainless steel crowns were placed after adequate tooth preparation, crown contouring and crimping. Occlusal interferences were also adjusted (Figure 3,4). Adequate fit of the stainless steel crown was confirmed by using radiograph. At 3 months follow up visit, patient satisfaction and proper oral hygiene was observed.



Figure 1: Pre-operative maxillary occlusal view



Figure 2: Pre-operative frontal profile view



Figure 3: Intraoral maxillary occlusal view after restoration with stainless steel crowns



Figure 4: Intraoral mandibular occlusal view after restoration with stainless steel crowns

Discussion

The term Amelogenesis imperfecta (AI) is a clinically and genetically heterogeneous group of disorders that affect the enamel, occasionally in conjunction with dentin, pulp, cementum, and extraoral tissues.⁷ Hypoplastic type of AI shows reduced enamel density and calcification, which can be observed clinically and well as radiographically compared to other types of phenotypes. Histologically, the enamel shows reduced enamel thickness and loss of enamel prism on the tooth surface.⁸ It is different from other types with its unique clinical characteristics. Hypocalcified type of AI is clinically characterized by soft enamel with normal size and shape of crown, dark brown discoloration. Radiographically, the thickness of the enamel is normal with less density compared to dentin. Histologically, the enamel shows defect in the enamel matrix and mineralization.⁹ There are multi-disciplinary treatment approaches, materials and techniques for management of AI. Clinical practitioners should consider restoring the form, function and to reduce the hypersensitivity of the posterior teeth. Multiple therapeutic treatment options are available in restoring the teeth affected by Amelogenesis imperfect such as onlays, preformed semi-permanent stainless steel crowns, metallic or ceramic crowns for posterior teeth, and direct/indirect composite restorations, veneers, and ceramic crowns for anterior teeth.³

Treatment planning should be done based on various factors like patient's age, type, severity of the anomaly and the signs and symptoms at the time of management. If there is an associated malocclusion, it should be discussed with an orthodontist and orthodontic treatment should be completed prior to the prosthetic rehabilitation.

Instructions on oral hygiene maintenance and dietary habits should be maintained to achieve successful treatment. Oral health in AI patient's will be compromised due to the rough surface, which increases the caries susceptibility and sensitivity while having cold and hot foods.¹⁰ In this case, semi-permanent restoration such as stainless steel crowns were placed in the permanent first and second molars with minimal crown preparation to avoid damage to the pulp and other tooth structure. The stainless steel crowns have superior durability, cost effective and requires only minimal technique.¹¹ Stainless steel crowns will be replaced with tooth coloured permanent crown after the completion of growth after eighteen years. Regular follow up visit was done to assess the durability of the restoration and patient satisfaction.¹¹

AI is a rare hereditary defect encountered in clinical practice with variable frequency. The management of teeth affected with AI should begin from primary dentition stage continued through mixed dentition into permanent dentition stage till adolescence. It affects the enamel of all the teeth present in the dentition uniformly. It has been found that the success of restorations in this type of AI affected teeth was greater compared to other types.¹²

Conclusion

Diagnosis and restoring Amelogenesis imperfecta is always a challenging task to the dental health care clinicians. The inherent risks and benefits should be considered and explained to the patient's before providing appropriate treatment. Periodical follow up is essential for long term success.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self

Ethical Clearance: Taken from Institutional Review Board

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An Evaluation of the Knowledge Gain by the Field Health Functionaries of Urban Local Bodies in Tamil Nadu after the Training on Applied Epidemiology

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Abstract

Background: In the urban set up of Tamil Nadu where there are growing public health challenges it becomes imperative that the existing public health machinery needs to be given short term trainings to understand the basic concepts of epidemiology so as to prevent or control an epidemic outbreak. **Objectives:** The present study intended to assess the knowledge gain of field health functionaries of Urban Local Bodies (ULBs) after attending the training on “Applied Epidemiology”. **Methods:** The study included about 395 trainees who attended the training during November 2017 to March 2018. The training was given in 13 batches with each batch covering about 30 participants. The duration of training was 3 days. Their knowledge gain was assessed using pre and post training evaluation using standard set of questionnaire. **Results:** The training was seen to have improved the knowledge of the trainees about the basic concepts in the field of disease epidemiology. This in turn will strengthen capacity of field health functionaries in the provision of epidemiology services by making them confident in the application of key areas of epidemiological practice, and adopting more reasonable approaches in the field. **Conclusion:** As a result of continued training and adaptability of the objectives of the training, the field activities of the public health officials will improve qualitatively.

Key words: *Epidemiology, Outbreak, Surveillance, Public Health and Knowledge Gain.*

Introduction

The number and caliber of public health professionals skilled in preventing and responding to disease epidemics needs to increase to combat the growing number of endemic, emerging and re-emerging infectious diseases that spread rapidly across borders, through countries and eventually throughout the world¹. The global network of Field Epidemiology Training Programmes (FETPs) has continued to grow and adapt to meet the changing needs

of public health and to improve field epidemiology training to produce skilled health professionals that increase public health capacity globally². For example, during the 2014 Ebola outbreak, the need for trained field epidemiologists was evident internationally; while there was international and regional capacity, there was reportedly a lack of local field epidemiologists to curtail the epidemic^{3&4}. Trained epidemiologists at these levels could have detected the Ebola outbreak earlier. Lopez et al. provide a few examples of when policy or services have changed due to work undertaken by trainees⁵ and Andre et al. report an improvement in timeliness of surveillance reporting in Benin as a consequence of short-term training of local public health staff⁶. Lopez et al. provided some examples of contributions that FETP trainees made to policy, but again the impacts were not quantified.

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Tamil Nadu Institute of Urban Studies enhances health security by training local public health staff to improve surveillance quality in their jurisdictions, which can be a valuable strategy to strengthen the capacity of Urban Local Bodies (ULBs) to more rapidly detect, respond to, and contain public health emergencies at the source. In the urban set up of Tamil Nadu where there are growing public health challenges it becomes imperative that the existing public health machinery needs to be given short term trainings to understand the basic concepts of epidemiology so as to prevent or control an epidemic outbreak. Hence this study intended to assess the knowledge gain after the training on applied epidemiology. It is considered that an improvement in knowledge about the basic concepts and principles of epidemiology will definitely improve the field activities in the early identification of disease outbreaks and controlling them.

Methodology

The persons targeted for the training were those responsible for collecting, analyzing and applying the health surveillance information, for the prevention of disease outbreak at the ULB level. The training was conducted at Tamil Nadu Institute of Urban Studies, Coimbatore from November 2017 to March 2018. About 395 trainees which included 57 Sanitary Officers and 338 Sanitary Inspectors from various City Municipal Corporations and Municipalities of Tamil Nadu attended the training. TNIUS identified resource persons to provide technical assistance to participants. Once the strategic model was established, identified resource persons were introduced to the training curriculum and some basic adult-learning principles before the launch of the first training.

The standardized curriculum and program schedule, incorporating both classroom lectures, simulation exercises, role play and fieldwork, were developed. Training materials were also given to the trainees, which incorporated the Changing concepts in public Health, International health regulations, Epidemiology of Communicable diseases, Integrated Disease Surveillance Project (IDSP) framework, which is used throughout India for disease surveillance and response reporting.

The program schedule consists of 3 days sessions introducing trainees to basic epidemiology principles

and importance of disease surveillance. The resource persons guided the trainees to analyze the data at the ward level. The trainees also learnt how and when to conduct field investigations and how to effectively communicate results. Trainees were exposed to the field practice to control vector borne disease outbreaks. The trainees were also engaged in a role play to stress the importance of Information, Education and Communication as a valuable tool in the control of communicable disease outbreaks. Through practical examples the trainees were taught about the way health planning and management should be done. There was also a session to encourage the trainees to come up with the practical issues and challenges in the control of communicable diseases. At the beginning and end of each batch of the training, the programme coordinator conducted pre and post training evaluations. Participant feedback was also obtained through questionnaires.

Profile of the trainees

The trainees were drawn from all the City Municipal Corporations (except Chennai) and Municipalities of Tamil Nadu. The training was conducted in 13 batches with each batch having strength of around 30 trainees. Totally 395 trainees attended the training.

Table 1: Designation wise breakup of participants

Profile of the Trainees	Number of Trainees	Percentage
Sanitary Officers	57	14.43
Sanitary Inspectors	338	85.57
Total	395	100.00

It was found that about 85.57 percent of the trainees were Sanitary Inspectors and 14.43 percent of the trainees were Sanitary Officers.

Table 2: Category of the Urban Local Bodies

Category of Urban Local Bodies	Number of Trainees	Percentage
Municipalities	296	74.93
Corporations	99	25.07
Total	395	100.00

About 74.93 percent of the trainees were from Municipalities and 25.07 percent of the trainees were from City Municipal Corporations.

Assessment of Knowledge Gain

At the beginning of the training programme, the participants were made to undertake a knowledge check

test using a questionnaire that contained 15 questions relating to the topics to be covered in the following sessions. On the third day of the training programme, the participants were given the same set of questions to evaluate the knowledge gained from the training.

Table 3: Assessment of Knowledge Gain

Question Number	Assessment of Knowledge	Percentage of correct responses in Pre Test	Percentage of correct responses in Post Test	Knowledge Gain (in percentage)
1	Properties of Chlorine	37	59	22
2	Terminologies used in investigating a disease outbreak	57	57	0
3	Making water safe for supply	55	70	15
4	Monitoring an outbreak response	24	42	18
5	Isolation and quarantine of patients	33	65	32
6	International Health Regulations	39	69	30
7	Disease surveillance	39	76	37
8	Trigger level for initiation of control measures	41	48	7
9	Transmission of vector borne diseases	51	79	28
10	Properties and dosage of insecticides	59	74	15
11	Legal provisions regarding control of communicable diseases	26	60	34
12	Correct technique of fogging	33	63	30
13	Disinfection methods	35	61	26
14	Promptness of Epidemic response	40	51	11
15	Role of Sanitary Officials in disease control	66	76	10

The assessment of the knowledge about the properties of chlorine, residual chlorine and storage of chlorine revealed that there was 22 percent knowledge gain after the training with about 59 percent of the participants able to answer this question correctly in the post test while only 37 percent answered it correctly in the pre test.

There was no significant impact on the knowledge gain related to important terminologies used while investigating a disease outbreak as about 57 percent of the participants were able to answer it correctly in both the pre test and post test. As nearly 43 percent of the participants have not gained knowledge in this area, it

becomes necessary that this topic needs special attention in the future trainings.

Regarding the methods of disinfection of water and making it safe for drinking, about 70 percent of the participants were able to give correct responses following the training as against 55 percent in the pre test and there was knowledge gain of about 15 percent.

Following a disease outbreak, the time period for which surveillance and control measures have to be carried out determines the end of the outbreak and its future recurrence. Hence the knowledge of the participants was assessed on this aspect. The analysis

showed that only 42 percent of the participants answered this correctly in the post test, but only 24 percent answered this correctly in the pre test indicating that there was a knowledge gain of 18 percent from this training.

The knowledge assessment about the isolation and quarantine practices showed that there was a knowledge gain of 32 percent from this training with 65 percent of the participants giving a correct response in the post test as against 33 percent in the pre test.

The knowledge about international travel and health was assessed to know how prepared the participants are to face a pandemic and 69 percent of the participants gave a correct response in the post test. Only 39 percent of the participants were able to answer this correctly in the pre test. There was a knowledge gain of 30 percent from this training.

Disease surveillance is of utmost importance in identifying an impending outbreak and hence the knowledge of the participants regarding ongoing activities of disease surveillance was assessed. The participants though were discharging this function at the field level, gave only 39 percent correct response in the pre training assessment. There was a remarkable 37 percent increase in the knowledge gain at the end of this training with nearly 76 percent of the participants giving a correct response in the post training assessment.

The knowledge about the trigger level for the initiation of control measures in any area was assessed and there was only 48 percent correct response in the post test. However there was a 7 percent increase in the knowledge gain as only 41 percent gave a correct response in the pre test.

The knowledge assessment about the transmission of vector borne diseases showed that as high as 79 percent gave a correct response in the post training assessment as against 51 percent in the pre training assessment. There was a knowledge gain of 28 percent.

As the use of insecticides was a day to day routine in the field work of the participants, the assessment aimed at the knowledge of the participants regarding the properties and the correct dosage of insecticides to be used while controlling vector borne diseases. There was a knowledge gain of 15 percent from the training with

nearly 74 percent of the participants offering a correct response in the post test and 59 percent in the pre test.

As legal action is sometimes warranted in curtailing a disease outbreak, there was a knowledge check on The Tamil Nadu Public Health Act, 1939 and its provisions related to control of diseases. Only 26 percent of the participants gave a correct response in the pre training assessment. But there was a significant 34 percent increase in the knowledge of the participants with 60 percent of the participants giving a correct response in the post training assessment.

As part of the training programme, there was a session on the practical demonstration of the fogging techniques and the dosage of insecticides to be used and the maintenance of the fogging equipment. There was a significant 30 percent increase in the knowledge of the participants with 63 percent of the participants giving a correct response in the post training assessment. Only 33 percent of the participants gave a correct response in the pre training assessment.

The knowledge assessment on the various disinfection methods found that there was a knowledge gain of 26 percent from this training with 35 percent of the participants giving a correct response in the pre test and 61 percent of the participants giving a correct response in the post test.

The knowledge of the participants regarding the promptness of initiation of control measures showed a gain of 11 percent after the training and 51 percent of the participants were able to answer the question correctly in the post training assessment as against 40 percent in the pre training assessment.

In order to ensure the knowledge of the participants regarding their role as field officers in the prevention and control of communicable diseases, a knowledge check was made. Many of them were well aware of their role, with nearly 66 percent of the participants turning out with correct responses in the pre training assessment. Nonetheless, there was a knowledge gain of 10 percent from the training with 76 percent of the participants giving correct response in the post training assessment.

Discussion

This training has targeted the field level public

health workforce in order to make them understand their routine responsibilities and expected duties promote critical thinking in them to detect unusual public health events, to report key epidemiological information to relevant authorities, and to immediately implement primary control measures as they are the first point in the supervisory hierarchy. The training was seen to have improved the knowledge of the trainees about the basic concepts in the field of disease epidemiology. This in turn will strengthen capacity of Sanitary Officers and Sanitary Inspectors in the provision of epidemiology services by making them confident in the application of key areas of epidemiological practice, and adopting more reasonable approaches in the field. The training has indirectly impacted the behavior and skills of the field workforce, motivating them to adopt innovations, improve service, and facilitate networking. The training will also help in decentralizing the data analysis and interpretation which will lead to timely public health response. However, there was a felt need for more practical exposure to a broader range of health protection activities during training, which could further embed field epidemiology within wider public health practice.

Conclusion

Such training programmes will make the public health officials to address their public health challenges during outbreak of diseases or disasters and act swiftly to prevent or control in epidemic situation. This will also enable them to share best practices at workshops or scientific conferences. As a result of continued training and adaptability of the objectives of the training, the field activities of the public health officials will improve qualitatively. Overall there was 21percent increase in the knowledge of the participants. However this training needs to be imparted periodically with more practical orientation to prepare the participants to face the threat and challenges of emerging and re-emerging infectious diseases.

Financial Support and Sponsorship: Nil

Conflicts of Interest: There are no conflicts of interest.

Ethical Clearance: Since this study did not involve ethical issues of human subjects, the issue of ethical committee clearance does not arise.

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Cognitive Behavioural Coaching Protocol for Adolescents' Perfectionism

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Abstract

Academic perfectionism undermines educational success among adolescents in secondary schools. Here, we describe a protocol for a non-clinical trial to evaluate the effectiveness of cognitive behavioural coaching (CBC) on academic perfectionism of schooling adolescents. The study will also explore the influence of gender on academic perfectionism of in-school adolescents. Senior secondary school, class two students will be included. A perfectionism proneness checklist will be used to measure their levels of perfectionism. The study will use a pretest-posttest non-equivalent control group quasi-experimental research design involving one experimental group and one control group. Specifically, it will involve non-random assignment of subjects to experimental and control conditions and pretesting of subjects on the dependent measure before the introduction of treatment followed by a posttest after the introduction of the treatment. The CBC will be conducted using a 6-weeks problem-solving coaching plan. All functional outcomes will be measured before and after the CBC intervention. The data will be analyzed using the intent-to-treat principle.

Keywords: *Academic perfectionism, Cognitive behavioural Coaching, In-school adolescents*

Introduction

Adolescence is a very sensitive developmental stage characterized by psychological upheavals which make the group highly vulnerable. According to the American Psychiatric Association¹, secondary school settings provide a lot of situations where adolescents display their abilities and performance in the presence of others (teachers and peers) and this achievement situations make some of them worry and be concerned with how others will judge them in case of potential failure. Presumably, this could increase their vulnerability to perfectionist tendencies. Some of them hold false belief and assumptions that one cannot pass examination without some form of assistance from others. Others use their high achievement obtained in their internal examinations with the help of others to set unrealistic high standards for themselves. Research studies consistently indicated that students' academic achievement is a problem at all levels of education in Nigeria.^{2,3} It was noted that factors contributing to students low achievement include among others, personal factors which are manifested in

unhelpful behaviours such as perfectionism.⁴

Perfectionism among in-school adolescents is evident in different areas of their endeavours including academic setting thus, academic perfectionism. According to Shafran and Mansell,⁵ academic perfectionism is an essentially negative construct involving setting excessively high academic standards for oneself or others. Frost et al.⁶ emphasized that these high standards are accompanied by tendencies for overly critical evaluations of one's own behavior, expressed in over concern for mistakes and uncertainty regarding actions and beliefs. In-school adolescents often engage in perfectionism as they approach academic demands. Such perfectionist behaviours could be attributable to negative academic outcomes such as a decrease in performance, negative emotions, low self-efficacy, academic adjustment problems, procrastination, and effort withdrawal.⁷ Also, students who are more perfectionists are less satisfied with their performance, experience higher levels of stress, prone to persistent worry and fear of failure.⁸

Consequently, several authors have proposed models for treating academic perfectionism, but these may have not been rigorously tested. Burns⁹ proposed a variety of cognitive interventions that could be used in the treatment of perfectionism, such as identifying the advantages and disadvantages of academic perfectionism, finding other sources of pleasure or worth and identifying cognitive distortions. Authors¹⁰ developed a self-help book for dealing with academic perfectionism which involved a wide range of cognitive and behavioural strategies including keeping a perfectionism diary, identifying triggers, examining standards and rigid perfectionistic beliefs, and developing goals and plans for change. Hewitt and Flett¹¹ suggested psychotherapy, focusing on the motivations for and antecedents of perfectionism, as the best treatment approach. However, these researches have traditionally taken place in a pure experimental setting. To be able to provide useful and helpful recommendations for students, teachers, parents and relevant educational authorities, an intervention that could be implemented at the secondary school level could be a nonclinical adaption of cognitive-behavioural therapy (CBT) such as cognitive behavioural coaching (CBC).

Study Objectives

We aim to evaluate the effectiveness of cognitive behavioural coaching (CBC) on academic perfectionism among in-school adolescents. We will also investigate whether the intervention could reduce academic perfectionism tendencies among a particular gender.

Method

Design

This prospective and open-label non-clinical trial will be performed in a school setting. A proneness checklist will be used to determine participants that are at-risk to academic perfectionism. This design will involve non-random assignment of subjects to experimental and control conditions and pretesting of subjects on the dependent measure before the introduction of treatment followed by a post-test after the introduction of the treatment. The at-risk in-school adolescents will be grouped into two; one to serve as the experimental group and the other to serve as the control group. During the 6-weeks postoperative intervention period, subjects

will participate in the cognitive behavioural coaching program. Functional outcomes will be measured before and after treatment. The trial has been registered prospectively. Important protocol modifications will be communicated to the trial registry.

Participants and eligibility criteria

In-school adolescents in SS11 whose means scores have indicated that they are at-risk of academic perfectionism will be included. In-school adolescents whose mean scores reveal that they are not prone to academic perfectionism will be excluded.

Sample size and recruitment

Because this study is a preliminary and open-label trial, the sample size calculation is not needed. A total of 70 subjects will be consecutively recruited. The participants will be drawn from two schools. Participant in one school will serve as the treatment group while the participants in the other school will serve as the control group. All in-school adolescents who meet the inclusion but not the exclusion criteria will be preliminarily screened by researchers in cooperation with school psychologists and counsellors. Students who agree to participate in the study will be enrolled.

Intervention

Having identified the schools that will be involved in the actual experimentation, the researchers and the school counsellors will schedule for training sessions before the actual treatment. The training will be conducted to educate the research assistants on the concept and field implication of cognitive-behavioural coaching and control program. These training sessions will last for three days after which the research assistants will be allowed to implement the CBC program in a field trial before the commencement of the actual treatment sessions.

The researchers will not be directly involved in implementing the coaching program but will guide and monitor the research assistants. Under the guidance of the researchers, the counsellors will first administer the pre-test. During the pre-test, all the participants in both experimental and control groups will respond to the pre-test instruments after which the instruments will be carefully collected making sure that all are retrieved.

Thereafter, the subjects will participate in 45 minutes sessions which will be held once a week for six consecutive weeks. During these periods, the experimental group will receive CBC coaching program while the control group will receive a conventional counselling placebo programme (PP). One week after the completion of the intervention sessions, the post-test will be administered to the subjects by the counsellors under the guidance of the researchers. Data collected through pre-test and post-test will be subjected to statistical analysis.

Outcome measures

The Maladaptive Academic Perfectionism Questionnaire (MAPS) developed by Steed et al.¹² will be used to seek information on the perfectionist behaviours of the students towards achievement in school. The MAPS is made up of 10 items in a 4-point Likert scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). Five of the ten items were negatively worded and reverse-scored to control for response bias. Items of the instrument include: "I never think the work I do is good enough," "I constantly worry that I won't do well on assignments," "I worry that others will discover that I am not as smart as they think I am," "I feel bad about myself when I don't get the grade I wanted on a test," "I don't dwell on my mistakes," "I judge my abilities in learning by the grades I receive," "I read my entire class syllabi multiple times," "It is not important if I make a mistake in my school work," "It does not matter if I get less than 100% on a test," and "I generally don't have to plan when I will get homework done in my day." Students with mean scores from 2.50 and above were regarded as having high academic perfectionism and vulnerable, while those with scores less than 2.50 were regarded as having low academic perfectionism and not at-risk. The MAPS was found to be of good psychometric properties.¹² To establish the reliability of the instrument in the Nigeria context, we trial tested it in 45 secondary school students in Nigeria. Cronbach alpha statistics yielded $\alpha=.83$.

Ethics and dissemination

The study will be performed according to the relevant guidelines of the Declaration of Helsinki 1964 as amended. Written informed consent for all interventions and examinations will be obtained at participants'

admission. The ethics board will be informed of all serious adverse events and any unanticipated adverse effects that occur during the study. Direct access to the source data will be provided for monitoring, audits, REC/IRB review, and regulatory authority inspections during and after the study. All participants' information will be coded anonymously with only the study team having access to the original data. The study results will be disseminated in peer-reviewed publications and conference presentations.

Data analysis

SPSS version 24 will be used to analyze the data. Mean, standard deviation and ANOVA statistics will be used to analyse data.

Discussion

While adaptive perfectionism has been linked to good school outcomes, maladaptive perfectionism has been found to undermine it.¹³⁻¹⁵ Therefore, it is necessary to seek to reduce clinical cases of academic perfectionism. Several types of treatment programs have been introduced in controlling clinical cases of perfectionism.^{16,17} CBC intervention could allow students to identify their pitfalls with respect to academic goals and strategies, and in turn, encourage them to revise their maladaptive approaches to efforts and achievements. CBC works by changing the individuals' perceptions, beliefs and worldviews that are unhelpful to their academic development.^{10,18} James and Rimes¹⁹ suggested that CBC training was effective in reducing maladaptive perfectionism. Shafran et al.²⁰ recorded similar result when they found that the cognitive-behavioural intervention for clinical perfectionism was effective in the reduction of both clinical perfectionism and binge-eating and that improvements were maintained at five-month follow-up. Riley et al.¹⁷ found that 15% of participants in CBC intervention significantly improved after treatment with effect size. However, there are no clinical trials of CBC in adolescents in senior secondary schools to date. In conclusion, the current study will be the first to the best of the researcher's knowledge to investigate the effectiveness of CBC in reducing academic perfectionism in a sample of in-school adolescents in Nigeria.

Ethical clearance- Taken from Faculty of Education

Research Ethics Committee at the University of Nigeria, Nsukka.

Source of Funding- Self

Conflict of Interest – Nil

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A General Correlation of Primary Implant Stability between the Non-Invasive Methods Osstell and Periotest.

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Abstract

Background: Dental implants have become one of the widest spread reliable treatment options in replacing missing teeth restoring both function and esthetics. One of the important criteria for a successful osseointegration of dental implants is achieving good primary and secondary implant stability. Various invasive and non-invasive methods have been used for measuring primary implant stability. Periotest damping device, and resonance frequency analysis (RFA) with the Osstell device have been classified as non-invasive methods. Primary and secondary implant stability measurements using both devices have given a reproducible quantitative value.

Aim/ Objectives: In this clinical randomized trial, a general correlation was done between the primary implant stability recorded using Osstell and that recorded using Periotest at the day of implant installation.

Materials and Method: Eighty completely edentulous patients were recruited. A single implant was placed in the midline of the mandible and primary implant stability was tested on the day of implant installation using the Oststell and Periotest devices. The implant stability quotient values (ISQ) and the Periotest values (PTV) were collected and statistically analyzed to detect if there was a general correlation between the two devices regarding primary implant stability.

Results: There is a general weak negative correlation between the readings of the two devices with a statistically significant difference between the Osstell readings to that of the Periotest readings ($r=-0.335$, -0.314).

Conclusion: Periotest readings on the day of implant installation seem to be as reliable as the readings of the Osstell device for recording primary stability.

Keywords: Dental implant, primary stability, Osstell, Periotest, correlation

Introduction

Dental implants have become one of the most widely spread, reliable treatment options in replacing missing teeth to restore both function and esthetics¹. One of the important criteria for a successful osseointegration of

dental implants is achieving good primary and secondary implant stability²⁻⁴. Primary implant stability has been defined as the absence of implant mobility immediately after installation⁵, which is achieved by mechanical interlocking between the installed implant and the surrounding bone⁶. Many factors can influence primary stability including; implant material used, microscopic and macroscopic morphology of the implant, bone quality/quantity, cortical thickness⁷, and the surgical technique used for implant placement⁸. Secondary implant stability depends on both bone formation and bone remodeling around the implant-bone interface.

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Secondary stability is influenced by the implant surface and bone healing time, which is initiated at the implant bone interface during the healing phase⁹.

Good primary implant stability is a key factor for the selection of the loading protocol to be followed¹⁰, and it is a crucial factor in the decision of immediate loading^{5,11,12}.

Various invasive and non-invasive methods have been used for measuring primary implant stability such as; histomorphometric analysis, tensional tests, push/pull outs tests, insertion and removal torque tests, percussion tests, radiographic analysis, damping capacity assessment using Periotest device, and resonance frequency analysis (RFA) using the Osstell device¹³⁻²³.

Primary and secondary implant stability measurements using both devices have given reproducible quantitative values.

Periotest was first introduced by Schulte 1983²⁴ originally designed to measure the signs of stress absorption around the periodontal ligament of natural teeth as a measure of mobility²⁵. Recently, it has been used to measure stability of dental implants. Periotest is a hand-held device consisting of a small computer with a hand piece that has an electro-magnetically driven tapping rod on the inside. The tapping rod would contact the tooth or implant and the contact time between the tapping rod and the implant or teeth is calculated into a Periotest value (PTV) ranging from -8 (low mobility/good stability) to +50 (high mobility/low stability) PTV units. Periotest has been used successfully to detect changes around the bone implant-surface and determine the success of osseointegration^{26,27}.

The Osstell device uses resonance frequency analysis (RFA) to measure implant mobility and stiffness which is interpreted as the Implant Stability Quotient (ISQ) value. ISQ values range between 1 (low stability) and 100 (highest stability). First studies using RFA were carried out by Meredith et al 1996²². The Osstell device used was an electronic fork that converts the KHz (Kilo Hertz) to ISQ values. Recently, the new magnetic RFA has a transducer, which is a metallic rod with a magnet on top that is screwed to the abutment or implant. The magnet is excited by a magnetic pulse from a wireless probe. After excitation, the peg vibrates freely, and the

magnet induces an electric voltage in the probe coil. That voltage is the measurement signal sampled by the resonance frequency analyzer, which gives the implant stability quotient value (ISQ). RFA has been used to evaluate changes in the healing patterns for different loading protocols during the initial weeks of implant healing¹².

In this clinical randomized trial, a general correlation was done between the primary implant stability recorded using both the Osstell and Periotest devices on the day of implant installation.

Materials and Method

The study proposal was approved from the Ethical committee of the Faculty of Dentistry Cairo, University on June 13, 2016 (Ethical Approval Number: 16/6/10).

Eighty completely edentulous patients were recruited from the outpatient clinic of the Prosthodontics Department, Faculty of Dentistry, Cairo University. Patients were seeking to install implants in the mandible to improve the retention of their prosthesis. Patients' age ranged from 50 to 69 years. Overall, 56 males and 23 females were included in this clinical trial with mean age of 62.5 years for males and 59.6 years for females.

Any systemic condition that contraindicated implant placement was considered to be an exclusion criteria. Patients with glycosylated hemoglobin above eight were excluded from the study. An informed consent was signed and approved by all patients.

All patients included had either newly fabricated complete dentures, or previous dentures with acceptable retention, stability and occlusion. Patients had implant installation after a six-week period of adaptation with their new prostheses. CBCT examination was done before implant surgery.

Implant Installation

Patients were prescribed a dose of 2 gm of Amoxicillin 2 hours before surgery. Implants installed in this study were Zimmer Dental (Implants ZDI, Tapered screw vent Indiana America) of diameter 3.7 mm, and length 10 mm. Drilling was carried out using the Zimmer dental kit following the manufacturer's instructions. ISQ was measured using Osstell (Osstell,

Integration Diagnostics Ltd., Sävedalen, Sweden). A smart peg was screwed to the installed implant, and one ISQ value for the buccal surface was recorded following the manufacturer’s instructions. Implants with an ISQ value of less than 60 were excluded from the study, as an ISQ value of 60 or above was considered to be one of the inclusion criteria.

This was followed by Periotest M measurements (Medizintechnik Gulden e. K., Modautal, Germany) (figure 1). The Periotest M was used on the mid-buccal surface perpendicular to the long axis of the screwed smart peg as described by the manufacturer, and one reading was recorded (Figure 2).

The fitting surface of the dentures were modified and relined using soft liner GC Soft-Liner, GC Corporation, Tokyo, Japan). Patients were recalled after 1 week for suture removal and further modification of the denture.

Osstell and Periotest readings were collected and statistically analyzed to detect if there was a general correlation between the two device readings regarding the primary implant stability on the day of implant installation. Data management and statistical analysis were performed using Statistical Package for Social Sciences (SPSS) version 21. Data were explored for normality using Kolmogrov-Smirnov test and Shapiro-Wilk test. Pearson correlation were used to detect any correlation between the surfaces of Osstell readings and Periotest readings. P-values ≤ 0.05 were considered significant.

Table (1): Correlation between the buccal (B), surfaces of the Osstell readings (ISQ) and the Periotest readings (PTV).

	Periotest (PTV)	
Osstell (ISQ)	Pearson Correlation	p value
B	-0.335	0.003

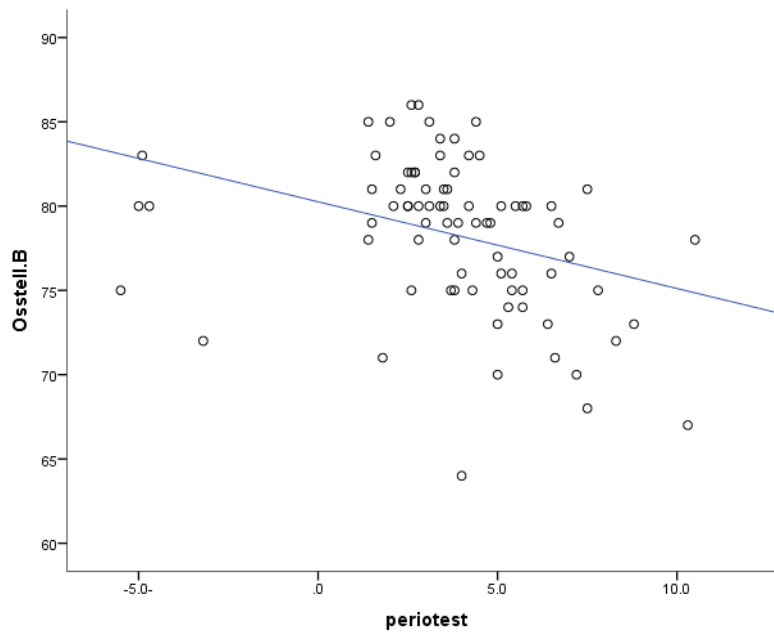


Figure (1): primary implant stability recorded using osstell



Figure (2): primary implant stability recorded using periosteal

Figure (3): Showing a negative correlation between the Osstell readings at the buccal surface and the Periosteal readings, which was statistically significant $p \leq 0.005$.



Results

When the Osstell and the Periotest readings were correlated, there was a negative weak, statistically significant correlation $p=0.003$, $r=-0.335$ (Table 1, figure 3).

Discussion

The increased demand for a non-invasive technique to detect and monitor implant stability has resulted in a higher usage of the Osstell and the Periotest devices. In the present study, the main aim was to try to find a correlation between the Osstell and Periotest readings while keeping all of the factors as constant as possible. Implants with the same length and diameter (3.7 mm x10 mm) were installed in the midline of the mandible, and primary implant stability was recorded using the same smart peg screwed to the implant.

The only variable that was difficult to control for both devices was the inter-operator and inter-instrument variable. During Periotest recording, the instrument was held horizontally at the mid-buccal surface of the screwed smart peg, with a valid distance of 0.6-2.5 mm between the tapping rod and the smart peg surface as recommended by the manufacturer. Olive and Aparicio 1990²⁸ reported that Periotest readings were sensitive to the position of the Periotest application on the surface of the abutment and the angulation of holding the instrument: A change in position of 1 mm of the Periotest striking may change the PTV readings between 1 and 2. Therefore, all efforts were done to fix the distance and angulation when using the Periotest device. As for the Osstell device, the measuring probe had to be held at a distance of 1-3 mm from the smart peg at an angle of 90 degrees 3mm above the soft tissue as per the manufacturer's instructions.

When the Osstell readings and Periotest readings were correlated in this clinical trial, there was a statistically significant negative correlation between the readings, indicating that measuring the primary stability with both devices yields comparable results. This is in agreement with a clinical study conducted by Oh and Kim 2012¹⁰ [10], which concluded that both devices can be used to predict primary stability and loading protocols. Other in-vitro studies revealed good negative correlations between ISQ and PTV²⁹⁻³¹

[32-34]. The results of the present study confirms that clinically, an increase of the Osstell readings resulted in more negative (-) values of the Periotest indicating good primary stability.

The Periotest device has shown to be more sensitive to intra-observer and intra-operator errors which have made its reliability questionable when compared to the Osstell device²³. However, the Periotest device is able to measure the primary implant stability directly at the abutment as it does not required the use of a smart peg to be screwed to the implant as the Osstell device. Therefore, the Periotest device presents a much easier and cheaper option to measure primary implant stability.

Conclusion

Periotest readings on the day of implant installation seem to be clinically as reliable as the Osstell readings for recording primary stability of dental implants.

Ethical Clearance- Taken from ethical committee - Faculty Of Dentistry –Cairo University

Source of Funding- Self

Conflict of Interest - Nil

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Comparison of Safety and Economic Burden of Dipeptidyl Peptidase-4-Inhibitor Versus Sulfonylureas in Type 2 Diabetes Patients Inadequately Controlled with Metformin; A Narrative Review

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Abstract

Objectives: The aim of this review is to compare safety and economic burden of Dipeptidyl peptidase-IV-inhibitor (DPP-4 inhibitors) with sulfonylureas (SU) in type two diabetic patients who was not achieve their glycemic goals with metformin.

Method: Two independent researchers identified related articles using PubMed, Cochrane, Scopus, google scholar and direct journals websites, all articles published between 2007 and 2018 that compare safety and economic burden of DPP-4 inhibitors versus SU were selected. Key words used were; sulfonylurea, DPP-4 inhibitors, safety, economic, cost effectiveness and incremental cost. both RCTs and Non- RCTs studies were included.

Results: In general, SU has significantly higher incidence of hypoglycemia and weight gain compared to DPP-4 inhibitors. Several studies shown that (3.12% up to 42%) of the patients who received SU experienced hypoglycemia whereas (0% up to 7%) of the DPP-4 inhibitor recipient experienced hypoglycemia. In addition, drug-related adverse events have been frequently documented in SU users compared to DPP-4 inhibitor users. However, other adverse effect was not remarkable. Cost-effectiveness analysis studies in different countries revealed that DPP-4 inhibitors - metformin combination with was cost-effective compared to SU - metformin combination.

Conclusion: It seems that DPP-4 inhibitors and SU has comparable safety except for hypoglycemia and weight gain which was higher with SU. DPP-4 inhibitors - metformin combination with was cost-effective compared to SU - metformin combination.

Keywords: *Dipeptidyl peptidase-IV-inhibitor, sulfonylurea, safety, economic, cost effectiveness and incremental cost.*

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Introduction

Diabetes mellitus (DM) is one of the highest prevalence chronic diseases, in 2019, the International Diabetes Federation revealed that there are 463 million diabetic patients around the world and expected to be 578 million in 2030 and 700 million by 2045. Also, they estimated that 9.3 % of adults with age of 20-79 years are diabetic. The majority of diabetes cases (90%) are Type

2 DM (T2DM).⁽¹⁻⁴⁾ According to several international guidelines, all T2DM patient should receive metformin in combination with life style modification as first line treatment.⁽¹⁻⁴⁾ However, many patients on metformin monotherapy fail to maintain long-term glycemic control.⁽¹⁾ Therefore it has been recommended to add second antidiabetic agent to metformin. These additional classes include; Dipeptidyl peptidase-4 inhibitors (DPP-4 inhibitor), sulfonylurea (SU), Thiazolidinedione, basal insulin, glucagon-like peptide-1 (GLP-1) agonists and sodium glucose cotransporter 2 inhibitors (SGLT2 inhibitor). The decision of which class of medication should be added is based on patient status such as evaluation of hypoglycemia risk, effect on weight, adverse effects, costs, and patient preferences.⁽¹⁾ SU has been used a lot in the past decades and until now some health practitioners favor to prescribe them because of the availability and low price. DPP-4 inhibitors are a new class of oral antidiabetic drugs that has been used in the last few years in clinical practice as add on to metformin due to acceptable efficacy and low side effect rate compared to SU. The aim of this article is to compare SU versus DPP-4 inhibitors in patients not adequately controlled with metformin in term of safety and economic burden.

Materials and Method

Two independent researchers identified and

evaluated the related articles using PubMed, Cochrane, Scopus, google scholar and direct journals websites, all articles published between 2007 and 2018 that compare safety and economic burden of DPP-4 inhibitors versus SU in type two diabetics inadequately treated with metformin were selected. Key words used were; sulfonylurea, DPP-4 inhibitors, safety, economic, cost effectiveness and incremental cost. Articles were selected if they were published in peer reviewed journals, in English, compare safety and economic burden, both RCTs and Non- RCTs studies were included. Studies that did not match inclusion criteria were excluded. All investigators evaluated the eligibility of the selected studies for inclusion. For each study, safety parameters and economic data were extracted.

Results and Discussion

Safety and Tolerability:

Hypoglycemia:

In general, SU has significantly higher incidence of hypoglycemia compared to DPP-4 inhibitors. Several studies shown that (3.12% up to 42%) of the patients who received SU experienced hypoglycemia whereas (0% up to 7%) of the DPP-4 inhibitor recipient experienced hypoglycemia (Table-1).⁽⁵⁻¹⁵⁾ Also sever hypoglycemia has been reported with higher rate in SU users compared to DPP-4 inhibitor.⁽⁵⁾

(Table-1) Studies that addressed Hypoglycemia incidence in DPP-4 inhibitor plus Metformin user's vs SU plus Metformin users.

Studies (DPP-4 inhibitor vs SU)	Percentages of patients developed Hypoglycemia %			
	DPP-4 inhibitor plus Metformin group	SU plus Metformin group	between group difference	P-value/95% CI
Gallwitz et al ⁽⁵⁾ (Linagliptin vs glimepiride)	7	36	-29	P <0.0001
Nauck et al ⁽⁸⁾ (Sitagliptin vs Glipizide)	5	32	-27	P <0.001
Ferrannini et al ⁽⁹⁾ (Vildagliptin vs Glimepiride)	1.7	16.2	-14.5	P <0.01
Goke et al ⁽¹⁰⁾ (Saxagliptin vs glipizide)	3	36.3	-33.3	P <0.0001
Abrar et al ⁽¹⁴⁾ (Sitagliptin vs glimepiride)	4.8	10.5	-5.7	P < 0.49
Prato et al ⁽¹³⁾ (alogliptin vs glipizide)	1.4	23.2	-21.8	p<0.001
Seck et al ⁽⁷⁾ (sitagliptin vs glipizide)	5	34	-29	95% CI (-33, -25)
Jeon et al ⁽¹⁶⁾ (vildagliptin vs glimepiride)	1 (number of patients)	10 (number of patients)	-9	P <0.05

*. Jeon et al reported hypoglycemia in number of patients rather than percentage

*. Jeon et al reported hypoglycemia in number of patients rather than percentage

DPP-4 inhibitor = Dipeptidyl peptidase-IV-inhibitor, CI = confidence interval, SU = Sulfonylurea

Changes in body weight:

Evidence showed that SU lead to a significant increase in patient's weight while DPP-4 inhibitors lead to minor weight loss. Several RCTs (Table-2) studied the effect of SU on weight compared to different DPP-4 inhibitor. Most of these studies found that patients who received glimepiride experienced weight gain whereas those who received DPP-4 inhibitor showed weight loss.^(5, 9, 15, 17-20) The same finding observed with glipizide^(8, 10, 13), and glibenclamide⁽¹⁸⁾. Jeon et al evaluated the weight changes in vildagliptin group versus glimepiride group compared to the baseline, they found that considerable weight gain was noticed in glimepiride group compared to vildagliptin group (2.35±1.21 kg, 0.23± 0.69 kg respectively) P<0.05.⁽¹⁶⁾ Filozof et al revealed that weight was almost not affected in vildagliptin group, whereas apparent increase of 1.36 kg in gliclazide group (+0.08 vs +1.36, P < 0.001).⁽²¹⁾

(Table-2) Studies that addressed changes in Weight between (DPP-4) inhibitor plus Metformin user's vs Sulfonylurea plus Metformin users.

Studies (DPP-4 inhibitor vs SU)	Weight mean change in kg from baseline			
	DPP-4 inhibitor plus Metformin group	SU plus Metformin group	between group difference	P-value/95% CI
Gallwitz et al ⁽⁵⁾ (Linagliptin vs glimepiride)	-1.4 kg	1.3 kg	-2.7 kg	P <0.0001
Arechavaleta et al ⁽¹⁷⁾ (Sitagliptin vs glimepiride)	-0.8 kg	1.2 kg	-2.0 kg	P <0.001
Nauck et al ⁽⁸⁾ (Sitagliptin vs glipizide)	-1.5 kg	1.1 kg	-2.6 kg	P <0.001
Ferrannini et al ⁽⁹⁾ (Vildagliptin vs glimepiride)	-0.23 kg	1.56 kg	-1.79 kg	P <0.001
Goke et al ⁽¹⁰⁾ (Saxagliptin vs glipizide)	-1.1 kg	1.1 kg	-2.2 kg	P <0.0001
Abrar et al ⁽¹⁴⁾ (Sitagliptin vs glimepiride)	-2.7±2.2kg	2.5±0.6kg		P < 0.002
Prato et al ⁽¹³⁾ alogliptin vs glipizide	- 0.89 kg	0.95 kg	-1.84 kg	p<0.001
Kumar et al ⁽¹⁶⁾ (Sitagliptin vs glimepiride)	-0.5 kg	1.58 kg	-2.08 kg	p<0.01
Gallwitz et al ⁽¹⁵⁾ (linagliptin vs glimepiride)	-2.06 kg	0.98 kg	-3.04 kg	P <0.0001 , 95% CI -3.83 to -2.25
Jeon et al ⁽¹⁸⁾ (vildagliptin versus glimepiride)	0.23± 0.69 kg	2.35±1.21 kg		P <0.05
Filozof et al ⁽²¹⁾ (Vildagliptin vs gliclazide)	+0.08 kg	+1.36 kg	-1.28 kg	P < 0.001
Koren et al ^{*(12)} (Sitagliptin vs glibenclamide)	Mean BMI gain was - 0.01 – 0.9 kg/m ²	Mean BMI gain was + 0.5 – 1.0 kg/m ²		p<0.001

*. Shlomit Koren et al study measured the effect on weight by using BMI instead of kg (7, 10, 16, 17)

DPP-4 inhibitor = Dipeptidyl peptidase-IV-inhibitor, CI = confidence interval, SU = Sulfonylurea

Other side effects:

Apparently DPP-4 inhibitor and SU have a comparable safety profile excluding hypoglycemia and weight changes as we explained above. Other side effect has been investigated and it seems that there is no significant difference between the two groups. Many studies concluded that there is no difference in upper respiratory infections, urinary tract infection,^(5, 6, 17, 18, 20) and pancreatitis,^(5, 10, 13, 18, 20, 22) incidence among DPP-4 inhibitor and SU. However, T. Seck et al found minor difference in UTI between sitagliptin vs glipizide (7.5% vs 4.3%, Difference: 3.2 (95% CI: 0.5-6.0)).⁽⁷⁾ Similar results revealed by M. A. Nauck et al (5.4 vs. 2.7%).⁽⁸⁾ The same scenario has been observed with nasopharyngitis, accumulating evidence suggest that similar incidence between DPP-4 inhibitor vs SU.^(5-7, 10, 18, 21) Moreover, other trials showed that sitagliptin and saxagliptin has slightly higher nasopharyngitis rate in contrast to SU.^(8, 17)

Drug related AEs:

Drug-related adverse events have been frequently documented in SU users compared to DPP-4 inhibitor users.^(9, 17, 18, 23) With hypoglycemia considered the main cause. D. R. Matthews et al results revealed that 39.8% of the glimepiride cohort complain of drug related AEs versus 20.7 % in the vildagliptin cohort.⁽⁶⁾ Another RCT found that 16.4% of gliclazide group have been affected with drug related AEs versus 11.8 % in vildagliptin group.⁽²¹⁾ Another RCT by T. Seck et al discovered that after two years of follow up higher incidence of drug related AEs reported with glipizide vs sitagliptin (33% vs 16.5%; difference -16.6 ,95% CI (-21.4, -11.7)).⁽⁷⁾

Discontinuation:

Some studies claimed that discontinuation due to side effect was lower in DPP-4 inhibitor than in the SU patients.^(5, 6, 9, 18) However, the difference observed in those studies were unremarkable and they did not show any statistical significance in addition other studies conclude that both class has similar discontinuation rate.

Economics:

In general, most of cost-effective analysis studies in different countries show that DPP-4 inhibitors added to metformin was cost-effective compared with adding a SU. Many studies explained that DPP-4 inhibitors were cost-effective compared with SU due to that DPP-4 inhibitors have favorable side effect profile compared with SU (especially hypoglycemia and weight gain).⁽²⁴⁻²⁸⁾

Schwarz et al did a cost-effectiveness study across Europe, and he found that sitagliptin was cost-effective compared with SU, with discounted incremental cost effectiveness ratio (ICER) values ranging from €5949/QALY to €20 350/QALY (quality adjusted life year) across European countries.⁽²⁵⁾ Athanasakis et al evaluated the cost-effectiveness for using sitagliptin compared to SU in Greece, they found that the incremental QALY for using sitagliptin is 0.042 and ICER is 8,582 € / QALY gained. Also, they conclude that using sitagliptin as add-on therapy could be cost-effective, compared to SU, for the Greek healthcare setting.⁽²⁸⁾ Another cost-effectiveness analysis that has been done in Greece, it shows that Vildagliptin was associated with 0.11 improved in life-years (Lys) and 0.11 improved in QALYs, compared glimepiride.⁽²⁹⁾ Erhardt et al studied the cost-effectiveness for using saxagliptin compared to SU in Germany. They found that saxagliptin was associated with similar life expectancy compared to SU, but with improving in quality-adjusted life expectancy. Also, they conclude that using saxagliptin consequential in an incremental benefit of 0.12 QALYs and ICER of €13 931 per QALY gained compare to SU.⁽²⁴⁾ Another study that assessed saxagliptin in Sweden, it found that saxagliptin was cost-effective compared to SU with ICER of 8845 € /QALY gained.⁽²⁶⁾ Another cost-effectiveness study that evaluated alogliptin in UK show that alogliptin 12.5 mg and 25 mg associated with ICERs of £10,959/QALY and £7217/QALY respectively compared to SU.⁽³⁰⁾ Two cost-effectiveness analyses were done in United States (US) that show comparable results for the studies that were done in Europe. The first study found that the 5-year QALY gain for the saxagliptin users was 0.53 with a cost of \$13,374 per QALY compared to glipizide. However, at 40 years, lifetime QALY gain

for saxagliptin increased to 2.64 per patient and cost per QALY was decreased to \$1052.⁽²⁷⁾ The other study found that the incremental life-years gained with DPP-4 inhibitors were 0.61 compared to SU, resulting in an ICER of \$19,420 per life-year gained.⁽³¹⁾ However, the results of the previous trials are within acceptable cost-effectiveness threshold in the United States. Moreover, Elgart et al found that saxagliptin is highly cost-effective in Argentina compared to SU with incremental cost per QALY and LYG gained were \$7,374 and \$20,490, respectively.⁽³²⁾

Conclusion

It seems that DPP-4 inhibitors and SU has comparable safety with higher incidence of hypoglycemia and weight gain seen with SU. Additionally, DPP-4 inhibitors were cost-effective compared to SU in type two patient not adequately controlled with metformin.

Conflicts of Interest: The authors have no conflicts of interest to declare.

Funding Information: No financial support for this review that could have influenced its outcome.

Ethical Clearance: Our present article is a review article. There is no need to get ethical clearance.

Abbreviations:

AEs = adverse events, DPP-4 inhibitors = Dipeptidyl peptidase-IV-inhibitor, SU = sulfonylurea, DM = Diabetes mellitus, T2DM = Type 2 Diabetes mellitus, SGLT2 inhibitor = sodium glucose co-transporter 2 inhibitors, GLP-1 = glucagon-like peptide-1, RCT = Randomized controlled trial, aHR = adjusted hazard ratio, ICER = incremental cost effectiveness ratio, QALY = quality adjusted life year, CI = confidence interval

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Effect of Date Emulsion Intake on Blood Sugars and Attainment of Half Marathon Ran on Wheelchairs

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Abstract

Today, after the science of food took its place in the construction of individual sports and non-sports specialists began to work hard to find paths to complement the work of sport for people with special needs along with the sport of misfits for physical preparation and skill in order to achieve achievement, and the importance of fluids in humans in general and people with needs In particular, the athletes have to take into account their daily needs in training and competition during and after the completion of training in order to avoid many troubles and disorders that occur to the body caused by the secretion of sweat and diarrhea due to many training variables Many athletes may fail to make up for lost fluids on a daily basis because thirst is not a good indicator of the body's need for fluids. These athletes drank enough fluids before participating in training or competitions to improve their performance. The introduction of the proposed liquid mixture by taking the emulsion of dates containing monosaccharides that are transmitted directly into the blood to compensate athletes in order to achieve the achievement in half-marathon running on wheelchairs as an important and important factor to maintain the body's energy supply during training and competition, especially in the half-marathon race.

Keywords: *date emulsion, blood sugars, half marathon, wheelchairs*

Introduction

Now that food science has taken its place in building an individual athlete and non-athletes, specialists began to work hard to find work paths complementary to the sport of special needs along with the sport of misfits for physical preparation and skill in order to achieve achievement. Liquids were one of the researchers' vital role in stabilizing the homogeneity between the external and internal environment of the human body, especially athletes with special needs on wheelchairs, because long distance or endurance athletes often face a major problem during training and competitions in hot and cold climatic conditions. It is a shortage of body fluids and sometimes up to the stage of dehydration, which must be overcome by drinking large amounts of water to make up for lost fluids. Maintaining an adequate supply of water in the body is very important for the functions of the cardiovascular system, respiratory system and thermal regulation of the human body. Water represents approximately (70%) of the body weight and

there are differences in the proportion of water between the bodies of individuals. It is high because the muscle contains a large percentage of water ranging between (65% - 75%) of its total weight ⁽¹⁾ 'and the importance of fluids in humans in general and those with special needs, which necessitated the athletes Observe their daily needs in workouts and athletic competition during and after you are In order to avoid many of the troubles and disorders that occur to the body caused by the secretion of sweat and diarrhea due to many training and health variables such as the training status of athletes, weather, type, intensity and duration of training, which reduces the amount of water and minerals in the body, and many athletes may fail to compensate fluids Lost from their bodies daily because thirst is not a good indicator of the body's need for fluids, so these athletes should drink enough fluids before participating in training or competitions to improve their performance. ⁽²⁾ Hence the problem of the research in the presentation of the proposed liquid mixture by eating the emulsion of dates in sugars and blood and the completion of half marathon

ran on wheelchairs as an important and important factor to maintain the body's energy supply necessary during training and competition, especially in the race half marathon. Whereas the activities of the various types of stretching throw their weight on the shoulders of the athlete. ⁽⁵⁾

Research methodology and field procedures:

Research Methodology

The researchers used the experimental method to suit the nature of the research problem, using a single experimental group with pre- and post-test

Research Sample:

The research sample was deliberately tested by the Paralympic players on wheelchairs in Diyala province.

Research tools and equipment:

Search Devices:

Spectrophotometer. (Kent Industrial Measurement SL), Centrifuge (Kottermann 4130 D 3165 Hanigsen / W-Germany Type 4171), Blood Pressure Monitor. Type (Speidle-Keller) German-made, heart rate monitor, stopwatch type (omege) number (2), hand calculator type (canon).

-Medical injection. (20), medical cotton, sterile material, red tubes containing (E.D.T.A) to prevent blood clotting (5 C.C). 20 (Cool Box) for storing blood samples during transfer to the laboratory, special glasses for drinking water, special bottles for keeping liquid, whistle, sunflower paper.

Research Tools

1. Registration form and test results.
2. Arab and foreign sources and the Internet.
3. Observation and experimentation.
4. Assistant Team (*).

Research procedures:

Determine some of the functional and physical characteristics of the research.

- Heart rate.

- Blood pressure (diastolic and systolic).
- Measurement of sugar before voltage, during and voltage.
- Performance table for half-marathon running on wheelchairs

Preparation of the proposed liquid.

After presenting the contents of the proposed liquid to be prepared to some experts ⁽⁶⁾ to clarify and confirm the materials that fall within the preparation of the proposed liquid as it consists of Iraqi Zahidi dates and water, in order to provide the liquid energy required to help the athlete to continue the exercise for as long as possible. The contents of the liquid consist of: - (AKGM) Iraqi Zuhidi dates because it contains a lot of mineral salts and vitamin (C), -- One liter of water.

Prepare the proposed liquid

To prepare the proposed liquid for one person we boil (1 liter) of water to the boiling stage and then add (kg) of ascetic dates and then leave for three hours to be filtered at high concentration and then add another four liters until the analysis and dilution of the proposed liquid to a liquid low sugar Most of these monosaccharides are easy to decompose and provide the athlete with the necessary energy. An important note is put the proposed liquid in the refrigerator at a temperature of (10) to preserve the contents of the liquid from non-oxidation, which negatively affects the health of the athlete and may not keep more than (48) hours to give the liquid Usually fresh.

Specification of functional and physical tests used. ⁽⁷⁾

Measuring Heart Rate:

Heart rate per minute was measured using an oxometer, measured at rest and immediately after the effort as follows:

The player sits and then put a special pinch connected to the device with the player's thumb as the device works to give the number of heart beats per minute.

Blood Pressure Measurement

Blood pressure is the most common method used in

hospitals and clinics and depends on the use of a blood pressure device and a stethoscope.

The player sits in a comfortable position and is not exposed to any effort and pressure is measured at rest. It is measured by wrapping the inflatable ligament from the pressure device around the upper arm so that it surrounds the brachial artery and then work to raise the air pressure inside the ligament and as a result of this pressure closes the brachial artery. If the stethoscope is placed above the brachial artery (below the ligament) and we do not hear a sound for non-flow of blood. And then start to allow the air to exit gradually and slowly and with the first sound of the pulse is heard by the stethoscope record the reading on the device which indicates the amount of high pressure or listen to the sound of the pulse and once the sound is hidden is recorded reading on the pressure gauge, which indicates the amount of low pressure Or diastolic and finally the final result of blood pressure measurement (systolic pressure and diastolic pressure).

Measurement of blood sugar

Blood sugar was measured by drawing blood from the research sample of the experimental group during rest and then during the runners using wheelchairs for a distance of (21) at a point of distance (10) km as well as at a point (15) km during the race and immediately after the completion of the race. In order to determine blood sugar

Exploratory experience.

In order to identify the obstacles that may appear during the main experiment researchers resorted to the exploratory experiment and the experiment was conducted on (9/12/2019) on Sunday on (2) of the research sample, and the random method and test them, because of the importance of knowing the time taken to perform Testing and knowing the response of the research sample and its cooperation in taking fluid doses and their hesitation in the process of drawing blood and knowing the validity of the devices and tools used in the test, and the adequacy of the assistant team to know the

performance of its duties during the main experiment to be carried out as quickly as possible.

Conduct the main experiment.

Pre-testing.

The pre-test of the group was carried out before the introduction of the proposed liquid mixture on the sample. The pre-test was done on (13/12/2018) on Thursday at ten in the morning as the functional and physical variables were tested.

Proposed liquid mixture doses.

It is the introduction of liquid mixture doses proposed to the training program of the sample without the intervention of researchers in the training curriculum, but give the liquid mixture doses within the training curriculum for a month and a half and three days a week, where the proposed liquid mixture was given to the experimental group. Proposed liquid mixture ratios were presented to the experts via a questionnaire form ⁽⁴⁾ and the suggested liquid dosages were.

Take (500 ml) before exercise at least two hours before exercise to equal body fluids and energy rates.

Take (150 ml) extra before the exercise for a short period ranging (3-5) minutes for more energy.

during the activity, take (100 ml) every (15-20) minutes to maintain the level of exercise performance.

Post test

The post-test was conducted on (31/1/2019) on Thursday, as the same tests were repeated in the pre-test.

Statistical means:

The researchers used the statistical system (SPSS) and included 4.1 Presentation of the arithmetic media and the standard deviations of the variables under consideration for the experimental group in the pre and posttests.

Table 1 shows the arithmetic media and the standard deviations of the variables under consideration in the pre and posttests of the experimental group

Post test		Pre-test		measuring unit	Variables
standard deviation	Arithmetic mean	standard deviation	Arithmetic mean		
3.054	63.727	4.336	65.00	Number	Resting heart rate
0.462	7.682	0.505	7.364	Mm / g	Low blood pressure
0.505	11.636	0.674	11.364	Mm / g	High blood pressure
5.013	130	4.540	115	Mg / dl	Measuring sugar before the effort
7.560	104	6.340	89	Mg / dl	Measuring sugar and during the effort. At a distance of (10) km
8.350	109	6.450	99	Mg / dl	Measuring sugar and during the effort. At a distance of (15) km
16.372	80.540	17.623	85.000	Accurate	Half marathon ran on wheelchairs

2- Presenting, analyzing and discussing the results of tests between the pre and posttests of the experimental group.

Table 2: sIt shows the difference of the arithmetic media, the standard deviation, the calculated and tabulated (t) values and the significance of the differences between the results of the pre and posttests in the research variables of the experimental group.

Significance of differences	The value of t		Standard deviation differences	Arithmetic mean differences	measuring unit	Variables
	mistake percentage	Calculated				
moral	000	6.876	1.282	1.273	Number	Resting heart rate
moral	0001	1.244	0.043	0.618	Mm / g	Low blood pressure
moral	000	3.235	0.169	0.272	Mm / g	High blood pressure
moral	0002	4.452	1.527	15	Mg / dl	Measure sugar before voltage
moral	000	3.450	1.230	13	Mg / dl	Measurement of sugar and during voltage. At a distance of (10) km
moral	0002	3.032	2.100	10	Mg / dl	Measurement of sugar and voltage during a distance of (15) km
moral	0001	23.250	1.261	5	Accurate	Half marathon ran on wheelchairs

It is shown from Table (2) that the difference of the arithmetic circles between the results of the pre and posttests in favor of the post tests in all research variables were significant and since the calculated value is greater than the spreadsheet, indicating the significance of the differences between the pre and posttests.

v Heart rate discussion:

Tables (1) and (2) show significant differences in the variables (pulse at rest time) between the results of the pre and posttests in favor of the post test. The researchers attribute this to the increase in the volume of blood temporarily through drinking fluids during physical effort and compensate for lost fluids as the decrease of water content of the body during the long physical effort leads to a decrease in the size of the heart stroke, which leads to the blood acceleration in the pulse and vice versa occurs when the water lost during the effort Physical as the size of the stroke increases and the heart tachycardia decreases ⁽⁹⁾. The low heart rate is a good indicator of the development of the cardiovascular system and has an impact on the level of sports achievement and then prolonged and the trend of heart rate to decline due to the increase in the volume of cardiac output in each heartbeat as well as the increase in the amount of oxygen carried by the same size of There are two types of changes that occur in the heart as a result of systematic training. They occur in the heart as a result of systematic training ⁽³⁾.

1. Changes in the morphological appearance of the most important (cardiac hypertrophy, increase in the thickness of the fibers, and the expansion of cardiac cavities).

2. Physiological changes, the most important of which (low number of heartbeats during rest or during physical effort and increase the duration of rest of the heart and the speed of the return of the heart to the normal state after the second effort and increase the volume of cardiac output). This reduces the acidity of the blood, ⁽⁸⁾, as Derfies (1980) noted that structured training works to adapt the heart to the effort, which leads to a decrease in heart rate during rest or not to give different training loads and so Compared to people who do not practice training systematically Herb is due to the amount of blood paid per stroke and the increase in rest period from one stroke to another ⁽¹²⁾

Conclusion

The research reached the following conclusions:

1. The presence of a positive and significant effect of the proposed liquid mixture doses in some physical and functional variables and through this achieved the first hypothesis.
2. The presence of a positive and significant effect of the proposed liquid mixture doses on the continuation of the performance of the physical effort and for as long as possible and is evidenced by the emergence of significant differences in the two tests before the group pretest in the run 21 km and in favor of the post test
3. Liquids containing carbohydrates and few mineral salts have much more benefit in terms of their effect on physical and functional variables in the post-test.
4. The need for the attention of coaches and workers in the field of sports to organize the administration of fluids at a regular dose during training.
5. Drink enough fluids before training to improve performance.
6. Take 500 ml of fluids before training to help you achieve a balance in the level of fluid in the body under normal and hot conditions.
7. The use of periodic examinations of the athlete in laboratories to find out the important influences that result from the work of different devices.

Conflict of interest: student of College of physical education and sport science, University of Diyala, Iraq.

Source of Funding: Self-funding

Ethical Clearance- Taken from: College of physical education and sport science, University of Diyala committee.

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Influence of Mind Mapping Towards Dental and Oral Hygiene Knowledge of Students

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Abstract

Background: One of the efforts to improve oral health, especially in children, is to carry out educational activities using Mind Mapping method since learning with this method is an easy way for students to understand the information about dental and oral health in the form of pictures, symbols or keywords so that it is interesting and does not bore students in receiving information. The purpose of this study was to determine the effect of education with mind mapping methods on dental and oral health knowledge of fourth grade students MIN Mesjid Raya Kota Banda Aceh, Indonesia.

Method: This type of research is a quasi-experiment with pre and post-test design with one group design. The research location was at MIN Mesjid Raya Kota Banda Aceh. The study was conducted with 49 respondents. The data collection techniques was in the form of questionnaires about dental and oral health knowledge consist of primary and secondary data. We used dependent T test with CI: 95% for data analysis.

Results: The results showed the frequency of respondents' knowledge with mind mapping media increased after being given education as much as 89.4% while before education was done using mind mapping methods is as much as 12.8%. The statistical test results obtained a p-value of 0,000 (<0.05) so that there is influence of mind mapping education on dental and oral health knowledge of the students.

Conclusion: It can be concluded that there is an influence of mind mapping education methods on students' dental and oral health knowledge. It is suggested to teachers to increase interest in efforts to promote health to students by increasing health education, especially regarding oral health.

Keywords: *mind mapping, knowledge, oral health*

Introduction

Health education in the sense of education in general is any planned effort to influence other people, whether individuals, groups, or the community, so that they do what is expected by health practitioners. This limitation implies the input elements (targets and educators from education), processes (planned efforts to influence others) and outputs (doing what is expected). The expected outcome of a health promotion is health

behavior, or behavior to maintain conducive health for the goal of health promotion⁽¹⁾.

Dental and oral hygiene maintenance according to the World Health Organization (WHO) (2012), is one of the efforts to improve health to prevent various oral cavity diseases. Dental and oral health is one aspect that supports a healthy paradigm and is a national development strategy to create a healthy society. Oral health, which is part of overall body health, is important to consider and requires immediate treatment as well as can affect the health condition of a person's body.

Dental and oral health education efforts have been carried out so far are still using methods of lecture, brushing learning and audio visual. These methods are generally cannot take attention from children. Children

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tend to like something interesting, attractive and directly practiced so they are capable to remember and easily accepted. Health education methods through schemes and pictures are often preferred so that they are more easily understand. Such method is called mind mapping method⁽²⁾.

Mind mapping is a creative, effective way of taking notes and will literally map our thoughts. The notes created form interrelated ideas, with the main topic in the middle and sub-topics and the breakdown into branches. The benefits of drawing and text someone to record or issue an idea that is in the mind, then we have used the two hemispheres of the brain synergistically. Especially if in the mind map then put some colors and things that strengthen emotions.

Mind Mapping is the easiest way to put information into the brain and take information out of the brain. The uniqueness of mind mapping occurs because every human being including children has different radiance (mindset, imagination, understanding, creativity, process information)⁽⁴⁾.

Mind mapping can help organize, store as much information as students want, and classify it in a natural way, giving easy and direct access as students want. Through mind mapping, it allows students to make connections, see patterns, access related memory that has been previously stored, and develop memory paths that already exist. This mind map activity involves hand movements to create maps, paths and connections between concepts. The process of continuous hand movements to connect this concept can improve the work of the brain in students, so that the ability to understand concepts in subject matter can be obtained maximally. For students with kinesthetic learning styles, the more body movement in the learning process, the more information will be gained.

It is explained that mapping concept consists of several parts. First is preparation. The specific step is that the research investigators outline the research goals, which could be first, obtaining a participant. Second step is generation in which in this step, there is a brainstorming group to collect information from the participant according to the questions proposed. Third is structuring. In structuring step, the separation is done with sorting-and-rating sessions to gain better

understanding of how items are related to one another. Fourth, representation which is computerized analysis to summarize the data into concept maps. This step is divided into the participat-processing stage and the researcher-processing stage. Fifth, is interpretation in which the participants are invited for sorting-and-rating sessions to address the goal of researchers exploring the participant. Last step is utilization. The researchers reconvene to discuss the findings upon the completion of data collection and analysis⁽⁵⁾.

Based on data from the Baiturrahman Community Health Center, 560 cases of caries were found in 15 elementary schools and MIN Mesjid Raya in Banda Aceh City, Indonesia and the highest percentage of caries rates was MIN Mesjid Raya in Banda Aceh, around 50 caries cases out of 80 people. Based on the results of interviews with 15 students, 10 of whom have poor knowledge about oral health. From the results of the researchers are interested in examining the effect of mind mapping method on school-age children's knowledge in terms of dental and oral health. The purpose of this study was to analyze the effect of mind mapping methods on dental and oral health knowledge of Grade IV MIN Mesjid Raya Banda Aceh City.

Method

This type of research is quasi experiment, where students are given treatment in the form of dental health mind mapping method. We used a pre and post-test design with One Group Design where the treatment will be done in 1 group. This research was conducted at MIN Mesjid Raya Banda Aceh City. The population in this study were all 4th grade with a total of 47 students. The sampling technique was with a total sampling technique.

The scope of the research is dental health knowledge including what is dental health, dental and oral disease, how to treat teeth, by using mind mapping methods so that it can determine its effect on dental and oral health knowledge of fourth grade students at MIN Mesjid Raya Banda Aceh City.

We analysed using univariate and bivariate technique in which univariate analysis is intended to see an overview of the independent variables, namely education of mind mapping of dental and oral health both before and after each treatment shown by tabulation

and description. On the other hand, bivariate analysis is to understand the influence of mind mapping method in dental and oral health by paired t test.

Result

The respondents in this research is divided into several category, i.e. general data and specific data. General data consists of age and gender while the specific data consists of univariate with sub of knowledge level of the students before and after the treatment of mind mapping. Apart from univariate, there is variate analysis, which obtain the influence method of mind mapping. The following tables show the statistical number related to this research.

Table 1 Frequency Distribution of Respondent based on Age

Age	N	%
10 years old	39	83,0
11 years old	8	17,0
Total	47	100

Table 1 shows the highest number of respondents based on age is 10 years with 39 students (83.0%).

Table 2 Frequency Distribution of Respondent based on Gender

Gender	N	%
Male	29	61,7
Female	18	38,3
Total	47	100

Table 2 shows the highest number of respondents by gender is male group with 29 students (61.7%), while the female students are only 18 people (38.3%).

Table 3 Knowledge Level before Implementation of Mind Mapping

Knowledge	N	%
Good	6	12,8
Fair	22	46,8
Bad	19	40,4
Total	47	100

Table 3 the level of student knowledge before the mind mapping method is 46.8% in the fair category, 40.1% of the level of knowledge is bad, while those included in the good category are only 12.8%.

Table 4 Knowledge Level after implementation of Mind Mapping Method

Knowledge	N	%
Good	42	89,4
Fair	3	6,4
Bad	2	4,2
Total	47	100

Table 4 shows the level of knowledge after an educational mind mapping method which is increased to good category in 89.4%, fair level by 6.4% while those with bad knowledge level were only 4.2%.

Table 5 Mind Mapping Influence towards Knowledge Level

Variable	Mean	R hitung	P value
Pre-test	58,09	-11,339	0,000
Post-test	90,00		

The results of the study as presented in Table 5 note that the knowledge of students after the mind mapping method is greater than before the method was carried out. This shows an increase in the knowledge level of the students about oral health. Statistical test results obtained the value of P = 0,000 (p = <0.05) so that at CI: 95% H₀ is rejected and H_a is accepted. Therefore, it can be concluded that at the 95% significance level, there is an influence of students' knowledge before and after the mind mapping method about oral health.

Discussion

Based on the research data above it can be seen that the results of statistical tests can be significant p = 0,000 (<0.05) at a 95% confidence level, thus it can be concluded that there is a significant influence between

students' knowledge before and after the mind mapping method about dental and mouth health at MIN Mesjid Raya Banda Aceh City.

According to researchers mind mapping methods with the use of images and colors will make students more interested and can remember material about oral health, so that students' knowledge will increase from before being given education with mind mapping methods. One way that can be used to improve knowledge and learning skills is by using the mind mapping method. Mind mapping was chosen because the method is one of the effective and efficient learning methods in which there are aspects of learning skills that are taking notes, remembering. This is reinforced by the results of research conducted which states that the mind map method is more effective than traditional methods⁽⁶⁾. Mind mapping can help students in learning and can increase knowledge so that they can achieve success in learning. This is reinforced by the results of research conducted which states that there is an increase in student learning outcomes through the application of mind mapping type cooperative learning models⁽⁷⁾. Research that tested the mind mapping method with learning skills was conducted, it stated that the mind map technique with the mind mapping method was effective to increase students' knowledge⁽⁸⁾. Learning methods with mind mapping are very suitable for developing children's thinking abilities. Mind Mapping is the easiest way to put information into the brain⁽³⁾. Mind mapping is a creative, effective, and literally literate way to "map" our thoughts. Mind mapping is a good method used as health education that involves cognitive, effective and psychomotor components. By utilizing symbols, images and colors when the child issues an idea that is in the mind, then the child has used the two hemispheres of the brain synergistically⁽²⁾. Mind mapping will help the students to learn information by giving them a force to organize it and put images as well as color to it⁽⁹⁾.

Mind mapping has several benefits including first, flexible, when the teacher or other people explain the material, students easily add it in the appropriate place in their Mind mapping without confusion. Second, focus attention because Mind mapping does not need to capture every word explained from the teacher or other people, simply by capturing the main ideas conveyed. Third, improve understanding and fourth, fun because

Mind mapping combines unlimited creativity and imagination of students, this is more fun when compared to taking regular notes⁽¹⁰⁾. This is in line with research conducted, that there is a significant difference between the results of the pretest and posttest in the experimental group with $p = 0.020$ so that it can be concluded that the mind mapping method can improve learning outcomes of integrated natural science subjects⁽¹¹⁾.

An experimental design of mapping was also used on nursing students in which successfully support as a cognitive tool for enhancing the students' critical thinking (CT) in the way of encouraging the students to explore the information. Besides, a paired t test was also used to identify whether the method is bringing betterment. The betterment is brought as the paired t-test showed the significant improvement for the students according to the value of $P < 0.001$ ⁽¹²⁾.

According to the results of research conducted also states there is an influence of the application of the mind mapping experimental method to increasing knowledge⁽¹³⁾⁽¹⁴⁾. The results showed there was a significant influence in the application of mind mapping learning models to the learning outcomes of grade IV students of SDN 2 Tanjung Senang. Mind map that is used as a treatment in this research is a form of learning strategy to understand the material by using notes as an external memory aid. Human memory is easier to store information in the form of images with long periods of time⁽¹⁵⁾. The results of making mind maps can be used as external learning aids so that they can be reviewed easily rather than reread as a whole. Making notes can function as a memory aid that is external⁽¹⁶⁾. Mind mapping is effective to improve the results of Junior High School student knowledge because there are advantages of using mind mapping in class which allows students to focus on the subject, give a clear picture as a whole in one paper and provide details and can group concepts and compare them.

Conclusion

According to the results, the level of knowledge of students before the mind mapping method is 46.8% in the medium category, 40.1% level of knowledge is lacking, while those included in the good category are only 12.8 while the level of knowledge of students after the educational mind mapping method had an influence

which was good to be 89.4%, medium knowledge was 6.4% while those with less knowledge were only 4.2%.

Ethical Clearance: Before conduct of the study, written permission was obtained from Poltekkes Kemenkes Aceh, Indonesia. The consent and willingness were established from all the subjects who meet the criteria for this research.

Source of Funding: Taken from Poltekkes Kemenkes Aceh committee.

Conflict of Interest: Nil

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The Flexibility in Terms of Some Biomechanical Indicators and their Relationship to the Performance of the Skill of the Hands Jump Back on the Ground Mat

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Abstract

The biomechanics of Gymnastics sport in general is the flexible in particular, the game of gymnastics has witnessed a rapid and significant development during the past decade and became involved in the game counted on a lot in the Olympic decorations being one of the multiple individual games with different activities, which can get multiple medals in the event that the team A high level of technical performance as medals that are calculated differentially to the participating countries as well as because they are games that need integrated qualities and overlapping and complex to reach high technical performance, and given the development of sport and its association with other sciences, including biomechanics The research aims to identify the elasticity of some biomechanical indicators and their relationship with the hands jump back of the cubs players in the artistic gymnastics, whereas the research methodology used the descriptive approach in the way of correlation relationships, and the research community included the cubs players in the artistic club Al-Kout sports (6) players, and (2) players who were surveyed were excluded.

Keywords: *Gymnastics, floor motion mat, biomechanical indicators, backhand jumping skill*

Introduction

Sport is one of the human activities that a community of societies is hardly devoid of practicing one of its activities. Sport is considered an art of academic arts that requires skill and mastery. ⁽¹⁾ Therefore, the countries were interested in opening colleges, schools and clubs to teach various parts of sports that qualify individuals and groups to enter competitions and participate in local competitions and Individual international and collective, including gymnastics in general and flexibility in particular, the gymnastic game witnessed a rapid and significant development during the system contract, and those involved in the game became very reliable in winning Olympic medals, being one of the Multiple individual father with its various activities and through

which multiple medals can be obtained in the event that the team is at a high level of technical performance as the medals are calculated individually for the participating countries and also because it is one of the games that need integrated and overlapping and complex qualities to reach high technical performance, and given the development Sport and its connection to other sciences, including biomechanics, through which weaknesses and strengths of motor skills can be identified in the simplest form. ⁽²⁾ Flexibility is an important motor skill in gymnastics, so most of the skills for this sport need high flexibility with all Body parts, especially the elasticity of the back, given the weak elasticity of the cubs category in the technical gymnastics, so the researcher decided to study this case to know the extent of the elasticity and some biomechanical indicators of the skill of the rear jump hands on the floor of the ground movements. ⁽⁵⁾

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Research Field Procedures:

Research Methodology:

The researcher used the descriptive method using the relational relations method.

Research community and sample:

The research community included the Cubs players in the technical gymnastics of Al-Kout Sports Club, which number (6) players, and (2) players who were subjected to the reconnaissance experiment were excluded, thus the number of members of the research sample became (4) players.

Collect information, tools and devices used

Collect information:

(Arab and foreign sources, the World Wide Web, data recording and unloading forms, performance evaluation form, analysis software, assistant work team, appendix (1)).

Tools and devices used

(Small Round Cylinder, Sponge Plugs, CAIS Camera Number (2) Camera Speed (3600 photos per minute), Camera RAM (8g) Number (2), Camera Stand Number (2), Dell Laptop Scale (1m), large illumination (1).

Exploratory experience

The researcher conducted the exploratory experiment on a group of Cubs players from within the research community and outside the sample, as they were (2) players at ten in the morning on Thursday, 15/15/2019 in order to get to know:

- Ensure the validity of video cameras.
- Ensure the clarity of the image and the accuracy of the data extracted.
- Knowing the obstacles that the researcher may encounter in order to overcome them during the implementation of the main experiment.

Identify some biomechanical indicators of the skill in question.

- Know the assistant team working on the road to take the test.

Choices

The tests are determined by evaluating the students' performance for the skill of the rear jump hands on the ground movements. Through 4 rulers, the lowest highest score is omitted, the middle score is taken, and the player's score is calculated through this evaluation.

Bridge test (bridge or arch back)

The purpose of the test: - To measure the flexibility of the spine

- The tools used: - tape measure - rug - chalk

- Organization: - Lie on the back with the legs bent and feet close to the hip, with the palms placed next to the head, with the fingers facing toward the heels.

- Performance description: - At the point of reference, the laboratory works to raise the entire stem upward with the arms and legs extended to make an arch in the back (dome) in the range that the laboratory can.

- Method of measurement: - The distance between the nearest point from inside between the hands and heels is determined and marked between the two points with chalk, then the distance between them is measured by a tape measure and this distance is an indicator for measuring the flexibility of the spine.

Main experience:

The researcher conducted the main experiment on the research sample of (4) players for the Cubs category in the technical gymnastics of Al Kout Sports Club. ⁽⁶⁾ And that at ten o'clock in the morning, Monday, 19/8/2019, to perform the skill of the hands jumping background on the floor movements, then the researcher recorded the measurements of the flexibility of the spine and the identification of biomechanical indicators according to the method of registration in the selection instructions and then recorded in the data registration form, as The researcher has chosen the shoulder angle and back angle in the main part of the skill under discussion. ⁽⁷⁾

Statistical means:

The researcher used the SPSS to process the results.

Presentation, analysis and discussion of results:

Display the results of the arithmetic mean and the standard deviations of the variables under consideration:

Table (1): Arithmetic circles and standard deviations of search variables

indication	Standard error	mistake percentage	standard deviation	Arithmetic mean	Statistical means
moral	0.05	0.02	4.54	89	Back angle bracket
moral		0.03	16.2	169	Shoulder angle
moral		0.000	1.34	8.4	Leap back hands

Discussion the Results

Through the results that have emerged, there is a significant correlation between some biomechanical indicators and the performance of the hands jumping skill on the background of ground movements, due to the close relationship between the elasticity of the back arch, which plays the primary and important role in the main part of the background hands jump skill on the floor movements, given the presence of a range Broad mobility among the members of the research sample and for the specificity of this age group, which is represented by the cubs category, and for the instructor's focus on biomechanical indicators in vocabulary exercises on this trait in particular, and the development of the trait of elasticity naturally at this stage as you indicate ⁽¹⁾ "The individual, and in particular the child, may have good flexibility by instinct to enable him to perform some movements, but it is not sufficient to perform more complex movements. So it became necessary when developing exercises to emphasize flexibility and include it in the programs for athletes, ⁽⁸⁾ especially beginners among them." The results are that there is an increase in the shoulder angle, as it is necessary to have an increase in the shoulder angle with the level of the vertical that helps to increase the strength of the arm, which gives the player an increase in the vertical back push that is important in the performance of the skill under discussion on the rug of ground movements, and this is confirmed by ⁽²⁾ "when performing the renaissance movement And leaving, which is between the holding stage of the bar and the stage of leaving the bar, the angles of payment are important in judging the correctness of the performance or its error, the less the

time of payment, the greater the amount of strength, and thus gives a vertical height, which reduces the torque of the weight, which becomes as a handicap during the performance, so the greater the time of payment Reduces the speed of the performance and thus affects the nature of the skill performance " ⁽²⁾, and the vertical position of the trunk helps the moment of rise to obtain the player's shoulder angle and thus generates an increase in the strength of the arm which in turn helps to give a greater vertical distance during the moment of payment To perform the turk skills on the carpet as ground "The increase in the starting angle is one degree, and it is offset by an increase in the distance of the jump (16 cm), provided that there is no significant decrease in speed" ⁽³⁾, and the movement of the arms up and back helps to give a movement momentum to the player, which helps to raise the center of gravity of the body that It gives a higher flight to the player while performing the skill, and the researcher attributes the reason for that to the movement of the arms when performing because of its importance in the success of the movement and giving the appropriate height to the body, as "the weighted right arms help to raise the center of gravity of the body when jumping between (20-25%) of the jump ⁽⁴⁾ which helps the player perform the technique better and the arms are weighted after a Leaving the ground increases the kinetic energy and angular momentum of the player, leading to raise the level of the player's performance of this skill. ⁽⁹⁾

Conclusion

Through the results, the researchers concluded that there is a close correlation between the flexibility

of the arch of the back, the biomechanical indicators and the performance of the skill of the hands jumping background on the mat ground movements of the young players in the gymnastics.

Conflict of Interest: student of College of physical education and sport science, University of Diyala, Iraq.

Source of Funding: Self-funding

Ethical Clearance- Taken from: College of physical education and sport science, University of Diyala committee.

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Impact of Ultrasound Waves on MPV in Diabetes Patients

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Abstract

Context: as it known diabetes mellitus Diabetes is a worsening pandemic and slim solutions. One of the vital important cells in human body are Platelets which are overlapping with diabetes mellitus. The increasing of platelets activity may cause vascular complications. this increasing may happening by kinds of stressor like ultrasound.

Materials and Method: Our study aimed to evaluate mean platelet volume MPV in diabetes patients when exposed to stressor factor which is ultrasound. this study was done in-vitro model. blood samples have been collected from 100 individuals divided in to two groups, 55 individuals were diabetes other 45 individuals were healthy. MPV was evaluated before exposing to ultrasound for all cases. After that all cases were exposed to ultrasound separately. The exposure period was determined for two periods 5-10minutes.

Results: Our result showed that after 5 minutes MPV start to increase in healthy and diabetic patients (mean±SD 9.04±0.86 for healthy, 8.91±0.90 for diabetic patients). After 10 minutes of ultrasound exposure, in healthy cases, MPV significantly increases (mean±SD 9.40±0.91). Surprisingly, in diabetic patients MPV significantly decrease (8.64±0.94) p-value for both were 0.001.

Conclusion: Mean platelet volume can be affected by diabetes, which leads to passive response. Furthermore, Ultrasound has an effective negative effect on mean platelet volume MPV. Ultrasound may be able to help reduce mean platelet volume in diabetic patients who are suffering from increasing of mean platelet volume as a type therapy

Keywords: Diabetes mellitus, mean platelet volume MPV, ultrasound

Introduction

Certainly, diabetes has become one of the most common diseases of this era ⁽¹⁾. according to WHO Diabetes has become common among many age groups, from children to the elderly ⁽²⁾. In case of diabetic situation, platelet play a vital role to reduce vascular complications ⁽³⁾. Mean platelet volume (MPV) is a good marker to evaluate the platelet function ⁽⁴⁾. wherefore, Diabetic cases have a higher risk of infecting micro- and macro vascular disease. Studies said that mean platelets volume may be include as a causative agent with respect to convert the platelet morphology and function ⁽⁵⁾. Ultrasound is one of the most widely used clinically imaging tests. Which is used to produce images of internal organs or blood vessels and works according to the principle of transmitting ultrasound waves from

the device, which are waves with high frequency so that their sound cannot be heard ⁽⁶⁾. Ultrasound used in many life areas , particularly in medicine ⁽⁷⁾. Ultrasound have a very wide frequency range depend on it uses, in medicine field ultrasound using 10 MHz in medical diagnostics and therapy. A lot of people commonly use the ultrasound in diagnostic which is lead to negative effect on the human body and health ⁽⁸⁾. Although ultrasound has commonly entered the field of curative medicine for instance Lithotripsy, tissue ablation in the treatment of tumor ⁽⁹⁾, gene delivery ⁽¹⁰⁾ and thrombolysis ⁽¹¹⁾. However, patients should avoid exposure to ultrasound whereas, the therapeutic and imaging mechanisms of ultrasound depended on the reaction of sound waves with any target of the body like tissue or organ, these therapeutic and imaging could also have hazardous biological impacts on body organ or tissue This effecting hazard which

may occurs is largely unpredictable furthermore the biological impacts of ultrasound could be dangerous to the healthy tissues. Because of the paucity of studies related to ultrasound impacts and risks, our current study investigated the effects of ultrasound on mean platelet volume in diabetics.

Materials Method

Our study was done in University of Diyala/ Medicine Faculty from November 2019 to February 2020. An agreement form has been obtained from each individuals before starting our study. Furthermore, the ethical guidelines constructed by the Scientific Committee of the Institute has been conducted. The patients were recruited from Iraq/ diyala city/ diyala teaching hospital. A total number of 100 subjects were enrolled in the study; 55 subjects with essential diabetic and 45 were healthy subjects. in current study, we excluded all cases who are suffering other infection like viral or bacterial infection also those who have allergy or taking any type of medications except diabetes medications. Questionnaire paper for each subject include name, age, weight and sex. 3ml of venous blood have been taken and putted into EDTA-tubes, each EDTA-tube was exposed separately to ultrasound vibration (sonoscape s50) for two time periods (5-10) minutes. The blood which used in our study directly examined after its withdrawal. Initially, before starting the exposing the blood have been analyzed after that blood samples were exposed to ultrasound with covering the probe to all area of blood

which is exist EDTA-tube. The platelet number (per cubic millimeter) also the mean platelet volume (fl) were analyzed for all blood samples before and after exposure to the ultrasound by using Coulter (diagon Ltd, D-Cell 60) AUTO HEMATOLOGY ANALYZER apparatus.

Statistical Analysis

Data of current study were analyzed by using Chi-square (X^2) test to compared between percentages. Also, measured sensitivity and specificity of mean platelets volume (MPV). Numeric data were described by (Mean \pm SD). T test used to compare between two numeric variables, while F test (ANOVA) used to compared between three numeric variables or more. A level of significance of $\alpha=0.05$ was applied to test. (SPSS v.22 and Excel 2013) programs used to analyze current data.

Result

100 cases were participated in our study grouped into two groups (45 cases were healthy as a control and 55 cases were diabetes). The mean age of study volunteers was significantly 34.30 ± 11.34 year for control cases and 53.94 ± 12.98 with range of 1-80 years (P-value =0.001). Mean and standard deviation values of the BMI for control individuals 26.90 ± 4.78 and 27.86 ± 5.02 . According to sex we didn't consider any changes because the cases numbers were not equal as show in table 1.

Table 1 comparison between anthropometric characters between study groups by using X^2 test.

Controls (45) Patients (55)			Groups		Total	Statistics
Age periods (years)	1-20	N	3	0	3	X ² = 40 Df= 4 P= 0.001
		%	7.0%	0.0%	3%	
	21-40	N	31	8	39	
		%	69%	15%	39%	
	41-60	N	10	32	42	
		%	22%	58%	42%	
	61-80	N	1	13	14	
		%	2.2%	23.6%	14%	
	>80	N	0	2	2	
		%	0.0%	3.6%	2%	

Cont... Table 1 comparison between anthropometric characters between study groups by using X² test.

Sex	Male	N	40	48	88	X ² = 0.03 Df=1 P=0.89
		%	88.9%	87.3%	88%	
	Female	N	5	7	12	
		%	11.1%	12.7%	12%	
BMI periods	<25	N	14	14	28	X ² = 0.76 Df= 2 P=0.68
		%	31.1%	25.5%	28%	
	25-29	N	18	22	40	
		%	40%	40%	40%	
	≥30	N	13	19	32	
		%	28.8%	34.5%	32%	

Mean platelet volume (MPV) have been analyzed for controls and diabetes cases before start exposure to ultrasound as shown in (figure 2), both of MPV values in healthy and diabetic cases nearly the same and no significant differences appear in statistics (8.68±0.89 in healthy cases, 8.83±0.92 in diabetic cases) (T= 1.01, Df=94, P-value= 0.34). The blood started to exposing by ultrasound for 5min then mean platelet evaluated again. We found that mean platelets volume started to increasing in controls and diabetes cases groups (9.04±0.86 in healthy control, 8.91±0.90 in diabetic cases) (T= 0.71, Df=94, P= 0.73). After that, the blood has been exposed again for 10min, interestingly, mean platelet volume restraint for healthy cases showed significantly increasing (9.40±0.91) while in diabetic cases start to significantly decreasing (8.64±0.94) (T= 4, Df=94, P-value= 0.001).

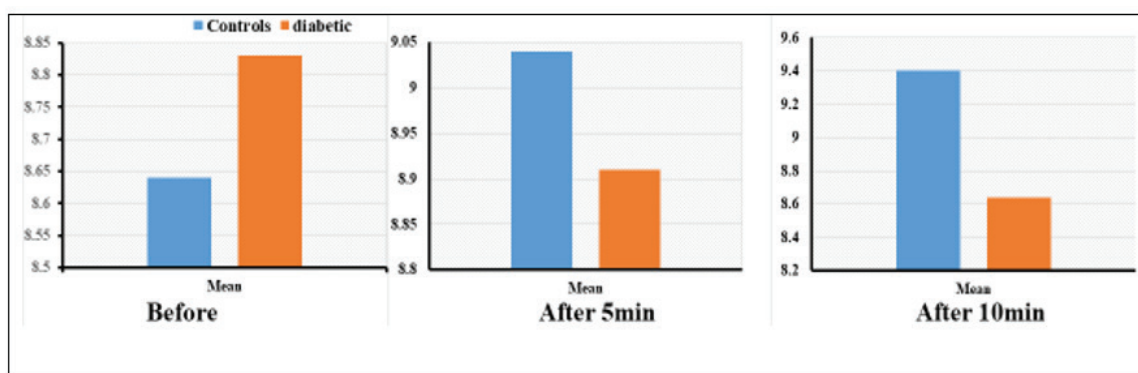


Figure (1) comparison exposures of MPV to ultrasonic between study groups.

Initially, the mean platelet volume response for diabetics was positive in the 5-minute of ultrasound exposure period compared with before exposure values. Surprisingly, the diabetics blood samples when exposed again to ultrasound for 10-minute, we found that there is a significant decreasing of mean platelet volume (F=1.2, Df=2, P-value=0.02) as in the figure 2.

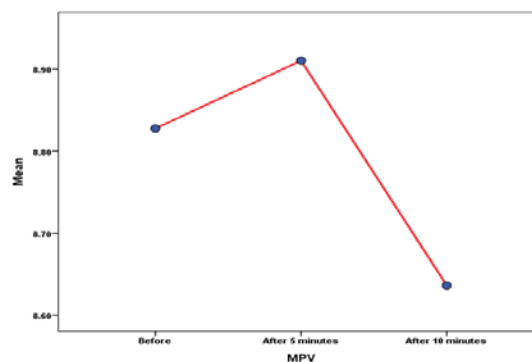


Figure (2) comparison among MPV exposures to ultrasonic in diabetic patients

Discussion

Diabetes is considered a chronic and complex disease in our world, which has a negative impact in the future on its owner, especially on eyes, kidneys, peripheral nerves and macro vascular structures⁽¹²⁾. The prevalence of diabetes is very high which distributed in most of western societies particularly in India, China and the United States^(13,14). Because of the complications caused by diabetes, it will be a burden on the economy of the person himself subsequently on the national economy especially in countries which recorded a high percentage of diabetes, these countries should face such issues. Studies suggest that MPV can use as a simple economical test to controlling DM and that way help inhibit the morbidity and mortality. MPV is a perfect indicator for the activity of platelets. If MPV large, it will be younger, reactive and agreeable platelet will be more granules also secrete more serotonin and β -thromboglobulin furthermore it will secrete more thromboxane A₂ than smaller platelets^(15,16). All of these may contribute to vascular disorders. Studies suggest that there is a relationship between MPV and diabetic in vascular complications, they found that there is a significant change in MPV which is reflect the state of thrombogenesis^(16,17). In this case may be the small bleeds because of the laceration of atherothrombotic plaques which led to increasing platelet mobilization, high reactivity and bone marrow inducement. These studies have been shown the increasing of MPV could be a risk factor to the vascular complications of DM lead to atherothrombosis⁽¹⁸⁾. Therefore, our study can be linked to the extent of the influence of MPV in diabetics when exposed to ultrasound. Our current study showed that there is a significant effect of ultrasound on MPV in diabetic patients. Although, ultrasound used as a therapy to some of diseases like; achieve collagen supra-molecular myoregenerationbphase, promote satellite cell proliferation, reduce oxidative stress, increase the differentiation of muscle lineage also in treatment of idiopathic thrombocytopenic purpura^(19,20). However, there could be a negative impact on diabetics. whereas, other studies clarified that there is a significant change on some of the hematological parameters including MPV⁽²¹⁾. Interestingly, in our study we found that the MPV of diabetic patients start to significantly decreasing after exposing to ultrasound for 10 minutes comparing with the healthy individuals, while the MPV in both of

diabetic and healthy was increased after 5 minutes of first exposure to ultrasound.

Conclusion

Our current study concluded that there are two opinions. First of which, it is possible that MPV in diabetics lacks an effective response when exposed to a specific stress such as ultrasound.

Other opinion, the reference was made to previous studies that found that there are effective increases in MPV in diabetic patients, which in turn leads to a risk of developing atherosclerosis⁽²²⁾. According to our current results, we can say, when the diabetic patients exposed to ultrasound for a definite period, the MPV will decreasing. Therefore, it can be considered that the diabetic patients who are exposing to ultrasound is a positive signal to reduce the increasing of MPV, thus reducing the incidence of atherosclerosis.

Conflict of Interest: (Nil – There are “NO CONFLICT OF INTEREST”).

Source of Funding: By researchers (THEM SELF).

Ethical Clearance: Committee members are approved to perform a study about:

“IMPACT OF ULTRASOUND WAVES ON MPV IN DIABETES PATIENTS”

After discussion of study plan with researchers:

- Ali Mousa Jaafar
- Mustafa Abdulkareem Salman

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Karasek-based Assessment of Psycho Organizational Constraints among Employees of the Faculty of Sciences in Kenitra, Morocco

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Abstract

Background: Certain trades, by their functions, are more likely to be affected by psychological problems such as psychological distress, stress. Employees in academic institutions are not immune to this behavior.

Objective: The object of our study consists in providing a Karasek-based study of the state of stress of the employees of the faculty of sciences of kénitra as well as determining the factors of stress at work.

Methodology: The tests used to evaluate this psychic and organizational behavior, are the Job strain model¹ Karasek 1979. The survey covers 70 permanent employees, 61.3% of whom are men and 38.7% are women.

Results: The results obtained show that 33.33% of the employees are under job strain or “work tension (low LD and strong PD) while 7.14% of the subjects are relaxed (weak PD and strong LD). However, 30.43% of respondents are passive (they both have low PD and low LD) while 29.09% of subjects are active (high PD and high LD). The factors of age, sex and seniority in the position have been found to be very associated with job strain. In fact, stress at work increases with advancing age, gender (more female than male) and seniority.

Conclusion: decision-makers in the sector must engage in approaches to fight stress, while putting in programs, activities to appease the general work environment.

Keywords: Faculty of Science; Kenitra; Karasek Questionnaire, Prevalence; Risk Factor; Stress.

Introduction

Mental health has become an essential element in occupational health in recent years. It is linked to psychosocial risks (PsRs)^{1,2}. Stress, the main consequence of these PSRs, represents the second health problem in the world of work (FORUM, 2002). According to OIT^{3,4}, stress at work is “The set of

reactions that employees can have when they are faced with professional demands and pressures that do not correspond to their knowledge and abilities and that question their ability to cope”.

Stress is a psychic behavior that can affect all areas such as the social sector, the banking sector, healthcare or educational establishments. It is recognized that the human factor is the main keystone of success; it is also one of the “biggest causes of failure”⁵. However, Administration in universities is an area where employees are particularly confronted with major requirements such as meeting the establishment’s objectives, speed of service, delicate working conditions. This can sometimes

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be stressful for employees. Despite the efforts made by those responsible for education to provide a quality work environment for their employees and thus reduce their stress, the latter in these two acute and chronic forms can affect the health of employees, thus weakening their performance, which has repercussions on the normal course of the establishment⁶⁻⁹. It seems clear that the workplace is a major factor in the stressor scale¹⁰⁻¹⁴.

In Morocco, little research has addressed this subject in regard to the state of stress of university administration employees. According to CSEFRS (2018)¹⁵, the overall number of students increased between 2016 and 2017 by approximately 4.2%, going from 957,513 to 997,338 students. This situation calls on all stakeholders in the sector to increase their efforts to succeed in this challenge; so this requires a lot of sacrifices on the part of the employees in the management of the administration. These efforts can lead to very high states and levels of stress.

With this in mind, we propose to assess the state of stress among employees of the faculty of science of kenitra, and to look for certain determining factors of this behavior.

Material and Method

1 -Context and population of the study

The study was conducted on 70 employees from Kenitra Faculty of Science. The 70 participants answered a questionnaire dealing with several items (socio-cultural, work schedule, etc.) and neuro-cognitive-behavioral tests (karazek test)

2 - Karasek Questionnaire (1979)¹⁶

It is a tool for evaluating psychosocial factors that can be encountered in the workplace which will be based on three dimensions: psychological demand, decision latitude and social support. It has 26 questions: nine for psychological demand, nine for decision latitude, eight for social support. The proposed answers are: "Strongly disagree, Disagree, Agree, Strongly agree", which makes it possible to rate them from 1 to 4 and calculate a score for each of the three dimensions (The threshold for decision latitude is 70 and the threshold for psychological demand is 21)¹⁷. If the psychological demand score is greater than 21 and the decision latitude

score less than 72, the individual is in the "stressed" dial and therefore considered in a Job strain situation.

The validation test of the questionnaire on Moroccan employees shows a very important internal consistency. The cronbach coefficients of all the scales and subscales are all greater than 0.7.

Statistical analyses

After filtration and coding, the data matrix is subjected to statistical analyzes of descriptive order (mean, standard deviation, etc.) and of multiple analytical order (chi-square independence test at 5% error, ANOVA one way; multiple regression). The results are expressed as absolute frequencies for the qualitative characters and on average for the quantitative characters.

Results

1- Sociodemographic characteristics of the respondents

The investigation is carried out on 70 people all exercise in the faculty of sciences of kenitra. 61.3% are men and 38.7% women. The sex ratio shows a predominance of men interviewed. 66.7% of them are married and 33.3% are single. In addition, 68% (n = 51) of respondents are in charge of administration (engineers, student affairs administrators, economic services, etc.), while 32% are technicians. The average age of the respondents is 36.73 ± 1.14 years, with a minimum age of 26 and a maximum age of 62; the dispersion does not exceed 27% (coefficient of variation).

2- Study of the dimensions of the Karazek Test

The test is made up of three dimensions: psychological demand (PD), decision latitude (LD) and social support (SS). Table (1) presents the average scores for these dimensions.

- The rate of employees who showed a strong psychological demand for PD (score greater than 21) is 63.72% (n = 46). The average score in this category is 26.65 ± 3.11 ; with a minimum score of 10 and a maximum score of 34. The analysis of variance shows a very highly significant difference between the average scores (Fisher = 122; p < 0.000).

- The distribution of LD scores shows that the rate

of employees who had low decision latitude (score less than 70) is 57.14% (n = 40). The average score in this category is 62.19 ± 7.49 ; with a minimum score of 30 and a maximum score of 70. The analysis of variance shows a very highly significant difference between the average scores (Fisher = 201.1; $p < 0.000$).

• For the dimension (SS), the rate of people who showed weak social support is 61.43% (n = 43). The average score in this category is 21.05 ± 2.85 , with a minimum score of 9 and a maximum score of 34 (no hierarchical support or support from colleagues). The analysis of variance shows a very highly significant difference between the mean scores (Fisher = 222.44; $p < 0.000$).

Table1. Variance analysis effect “category of work stress” on the score obtained for each dimension

Dimension	Modality	Effective (in %)	Average	Standard deviation	Min	Max	Fisher (p-value)
PD	weak	24 (34,28%)	17,89	2,33	10	21	122,000***
	Strong	46 (63,72%)	26,65	3,11	22	34	
	Total	70	22,27	3,52	10	34	
LD	weak	40 (57,14%)	62,19	7,49	30	70	201,1000***
	Strong	30 (42,86%)	80,07	5,33	73	92	
	Total	70	71,13	10,55	30	92	
SS	weak	43 (61,43%)	21,05	2,85	9	24	222,440,000***
	Strong	27 (39,57%)	27,07	2,06	25	34	
	Total	70	24,06	3,23	9	34	

*** : highly significant difference; min: minimum; max:maximum

3. Projection of the average points of the two dimensions psychological demand and decision latitude

Job strain, that is to say the tension at work is the combination of low decision latitude and high psychological demand (DP score is greater than 21 and LD score is less than 70) the person is in the “stressed”

dial therefore considered in a Job strain situation. The results of the projection of the scores of the respondents (Figure 1) show that 33.33% of employees are under the Job strain or “tension at work (low LD and strong DP) against 7.14% of the subjects who showed themselves relaxed (Low DP and high LD). However, 30.43% of respondents are passive (they have both low PD and low LD) while 29.09% of subjects are active (have high PD and high LD). .

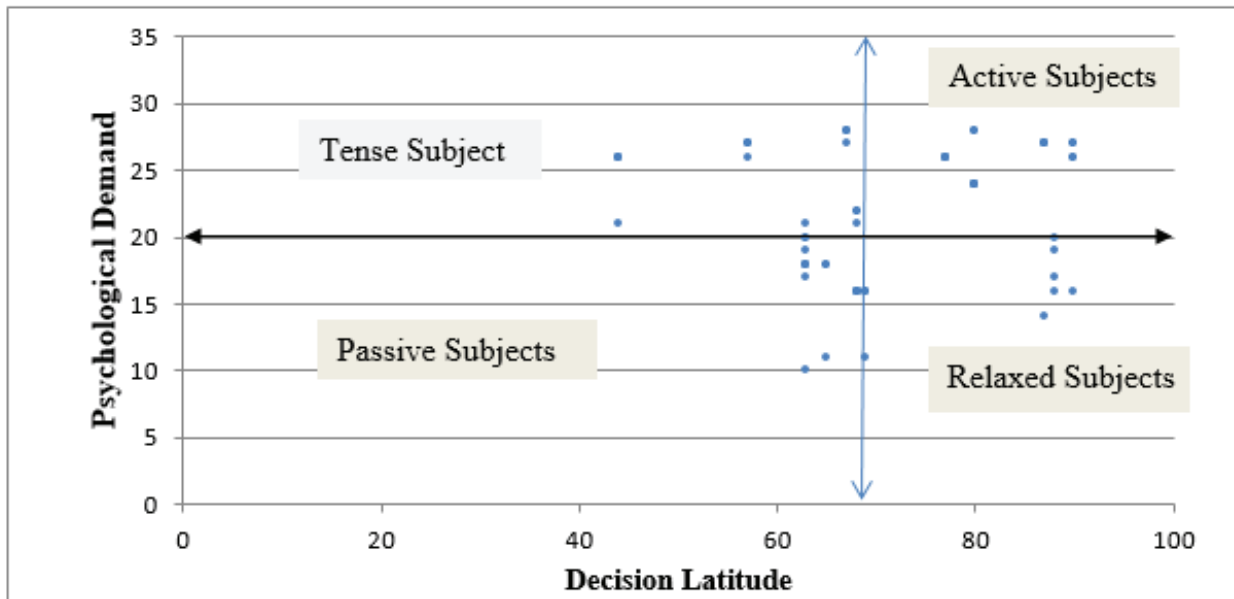


Figure 1: projection of the scores of the two dimensions psychological demand (PD), decision latitude (LD) “Job strain model” Karazek 1979

4. Multiple correlations between the three dimensions

The results of the correlation of the dimensions two by two (Table 2) show that psychological demand is negatively correlated with social support ($r = -0,345$; $p < 0.001$), as well as the decision latitude is positively correlated with social support ($r = 0,333$; $p < 0.000$). On the other hand, psychological demand evolves in the opposite direction to decision latitude ($r = -0.41$; $p < 0.003$). People who showed strong psychological demand developed weak decision-making latitude and did not have sufficient support either from their colleague or from the hierarchy.

Table 2: correlation between the three dimensions

	PD	LD	SS
PD	1	-,41 ($p < 0,003$)*	-,345 ($p < 0,001$)*
LD		1	,333 ($p < 0,000$)**
SS			1

*: Highly significant difference; **: very highly significant difference

4. Analysis of multiple regressions

The analysis of multiple regressions including the dependent variable and the LD and PD score is presented in table (3). As a result, the three factors gender, age

and seniority in the job are major risk factors for strain jobs. The regression coefficients show that these factors evolve in the same direction as the strain job. Indeed, stress increases with age, seniority and so in the female sex.

Table 3: results of multiple regression (dependent variable = strain job)

Variable	Unstandardized coefficients		« T student »	Significant.
	A	Standard Error		
(Constant)	,267	,177	1,57	,03*
Age	,111	,004	1,1	,01*
Sex : Men= code 1 Women= code 2	,077	,123	,153	,003**
Seniority	,240	,176	1,55	,028*

*: significant difference; **: highly significant difference

Discussion

The research that we have done within the faculty of science on administrative employees has focused on the state of stress experienced by these employees as well as the risk factors that determine this psychosocial behavior and its repercussions on the health of respondents.

Following this study, several elements are to be noted. In fact, the prevalence of people under the Job strain or “working tension” is 33.33% (low LD and high DP). However, the rate for people with strong PD is 63.72% and the rate for those with weak LD is 57.14%. On the other hand, the rate of people who showed weak support from colleagues or the hierarchy is 61.43%. A study entitled People First: Driving growth in emerging megacities, by Cabinet Mercer, found that 38% of Casablanca employees suffer from high stress levels. According to a Tunisian study carried out in 14 Tunisian private sector companies, the rate of stressed people was 17% according to Karasek’s model¹⁸. In France, the SUMER survey (2003) showed that 23.3% of the responding workers were on job-strain¹⁹.

A study carried out on firefighters in Belgium showed that 14% were in a situation of tense work²⁰. In a German hospital, 55.5% of doctors were tense²¹. In Australia, the rate of workers with a job strain reached 23%²². The risk factor research shows that the tense state of employees is significantly linked to age, sex and seniority. The results of the multiple regression show that job strain increases with age, it is important in young people less than 40 years of age. This result

agrees with that found in numerous studies around the world^{23,24}. On the other hand, in our study, the rate of women undergoing job strain is high compared to men. This result has been confirmed in several studies such as that of^{23,25}. Acute or chronic work stress can lead to complications in the health of the person affected. Large-scale research, mainly conducted in the United States and Sweden, has shown the predictive power of the karasek model on cardiovascular diseases and psychological distress²⁶⁻²⁹

During our investigation, we encountered certain challenges such as the scarcity of research carried out in Morocco on job strain in relation to university employees. Another limiting factor concerns the size of the sample questioned (limited human resources).

Conclusion

The main purpose of this study was to assess the level of stress among a group of employees in the Kenitra Faculty of Science. It is of great interest to know it to allow employees to preserve their health. The manifestations recognized by the employees are numerous. These include the lack of organization, the ignorance of the time allotted for carrying out a task, the little or badly defined Objectives and multiplication of the tasks. Those who are in charge must work on all these imperfections in order to boost the efforts provided by the employees. This work is a step forward in understanding the state of stress of university employees. As a result, managers have shown a great interest in engaging in anti-stress approaches, while putting in programs, activities and

calming the general work environment.

Conflict of Interest: No

Source of Funding: No

Ethical approval:

The procedures were carried out in accordance with the recommendations of the Internal Ethics Committee of the Ibn Tofail University Kenitra. This procedure were examined and approved by the Committee

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The Effect of Gastrointestinal Symptoms to Body Mass Index (BMI) of People with HIV/AIDS in Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar, South Sulawesi 2017

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Abstract

Human Immunodeficiency Virus (HIV) results in a weakened immune system, making it vulnerable to various types of infections, systemic disorders and weight loss. In Indonesia, the incidence and mortality rates from HIV/AIDS were still relatively high, especially in Makassar, South Sulawesi Province. This study aimed to determine the dominant factors associated with nutritional status on people living with HIV/AIDS (PLWHA). This research was a quantitative research with cross-sectional design, involving 80 respondents of PLWHA aged ≥ 18 years. Data collection used a structured questionnaire included demographic, clinical, and behavioral factors, while nutritional status was measured by body mass index (BMI). The results showed that most of respondents had normal nutritional status (67.5%), followed by underweight (20%) and overweight (12.5%). Gastrointestinal symptoms were the dominant factor related to nutritional status (BMI) after controlling confounding variables such as smoking habits, food security status, and alcohol consumption (AOR = 4.78 and p-value = 0.01). Nutrition education could improve the nutrition intake and dietary behaviour of PLWHA at Kelompok Dukungan Sebaya foundation (YPKDS) in Makassar City.

Keywords: HIV/AIDS, Nutritional Status, Gastrointestinal.

Introduction

Terminating epidemical of *Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AID)* is one of the global targets of Sustainable Development Goals (SDGs) in 2030, and every country has commitment for that. HIV has affected many sectors and become a serious problem for policymakers^[1]. HIV infects human immune system cells and destroying its functions. According to *World Health Organization (WHO)*, this viral infections produce progressive damage that results in the decreased of immune system and has possibility to develop an *Acquired Immunodeficiency Syndrome (AIDS)* which is characterized by the occurrence of opportunistic infections or related

cancers^[2].

Based on the report of the Directorate General of P2PL, Ministry of Health of Indonesia, the incidence and mortality rates from HIV/AIDS in Indonesia were still relatively high^[3]. Cumulative amount reported related to HIV infections from 2005 to December 2016 (232.323 cases), the highest amount of infection was in the Jakarta Province as much as (45.335 cases), followed by East Java, Papua, West Java, and Central Java while South Sulawesi province was in the ninth position with 5445 HIV cases and 2257 AIDS cases^[2].

Nutritional status was a person's body condition as the result of nutrition intake and its utilization in the body. Providing support and attention could help PLWHA in maintaining nutritional status, immune response, managing the severity of symptoms, increasing their response to antiretroviral therapy and other medical treatments^[4].

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HIV prevalence since 2000 continued to increase and exceed 5% which meant that the level of HIV epidemic in Indonesia had entered a concentrated epidemic. Makassar City in South Sulawesi was ranked as the third ranked City with the highest number of people living with HIV/AIDS in Indonesia, after Jayapura and Jakarta^[5].

The number of HIV/AIDS patients in Makassar City was continuing to increase every year, data by Komisi Penanggulangan AIDS (KPA) Makassar showed that the cumulative number reported from 2005 to June 2015 reached up to 8085 cases consisting of 5282 HIV cases and 2803 AIDS cases. The total cases of new HIV case reported in Makassar in 2015 was 665, with 451 men 214 and women ^[5]. The objective of this study was to analyze the factors related to the nutritional status on people living with HIV/AIDS (PLWHA).

Method

This was a quantitative research using a cross-sectional design study. The main purpose of this study was to find the correlation between demographic, clinical, and behavioral factors with nutritional status in people living with HIV/AIDS (PLWHA). This research was conducted in April-June 2017. The location of this research was at the Yayasan Kelompok Dukungan Sebaya (YPKDS) as the originator of the Peer Support Group (KDS) Makassar City.

The population in this study was all of the people living with HIV/AIDS (PLWHA) registered at Yayasan Kelompok Dukungan Sebaya (YPKDS) Makassar City totaling 100 people. The sample in this study were people with HIV/AIDS (PLWHA) who were registered and actively participated in the activities of Yayasan Kelompok Dukungan Sebaya (YPKDS) Makassar and met the inclusion and exclusion criteria. The calculation of sample size using the formula of the hypothesis difference of 2 proportions obtained a minimum sample of 80. Thus the total respondents involved in this study was 80 PLWHA.

Sampling conducted with a *purposive sampling method* on PLWHA who has met the inclusion criteria. The list of names was obtained from the members list of each peer group integrated into health services (PUSKESMAS). Sources of data collected using primary

data obtained from questionnaires including Household Food Insecurity Access Scale (HFIAS) questionnaire for food security measurement, and antropometric measurement for nutritional status reflected by Body Mass Index (kg/m^2); while secondary data collected by looking at the medical records of respondents from PUSKESMAS.

The bivariate analysis was done by using the Chi-Square test with a degree of confidence of 95%. In bivariate analysis, the nutritional status was classified into two categories, underweight and not underweight (normal and overweight). While multivariate analysis was used to find out the most dominant variable affecting nutritional status on PLWHA by multiple logistic regression test.

Result

The study showed that nutritional status on people with HIV / AIDS (PLWHA) were mostly normal (67.5%), followed by underweight (20%) and overweight (12.5%). The respondents were mostly men (80%) and had the age average as 33 years. Half of the respondents graduated from high school (50%) that was classified as having high educational background. The majority of respondents were working (77.5%) and had unmarried status (48.8%).

Most of respondents underwent antiretroviral treatment (96.2%), did not experience gastrointestinal symptoms (61.2%), and did not have opportunistic infections (76.2%). Most of respondents also did not have smoking habit (55%) and did not have alcohol consumption habit (86.2%). While the food security status of the respondents showed that most of respondents had food security status (66.3%).

The results of bivariate between gender and nutritional status showed that the proportion of underweight nutritional status on men was higher (21.9%) than women. Statistically, there was no significant correlation between gender and nutritional status ($p\text{-value} > 0.05$).

Educational level variables were categorized as low and high education. The results of the bivariate analysis showed that the proportion of underweight nutritional status of er respondents with low education was higher

(21.4%) than the higher one. Statistically, there was no significant correlation between education level and nutritional status (p-value > 0.05).

The results of bivariate analysis between employment status and nutritional status showed that the proportion of underweight nutritional status of respondents who did not work was higher (22.2%) than them who had work. Statistically, there was no correlation between employment status and nutritional status (p-value > 0.05).

The results of bivariate analysis showed that the proportion of underweight nutritional status was higher

on respondents who were married (26.7%) compared with respondent who were unmarried/divorced. Statistically, there was no correlation between nutritional status and marital status (p-value < 0.05).

Clinical factors including ARV treatment and opportunistic infections did not have a significant association with nutritional status, whereas gastrointestinal symptoms were statistically correlated with underweight nutritional status with OR = 4.84. It means that the respondents with gastrointestinal symptoms had a chance of 4.8 times to be underweight compared with respondents who did not experience gastrointestinal symptoms. (Table 1)

Table 1. Bivariate analysis of factors related to nutritional status on PLWHA

Factors	Nutritional status		Total	OR (95% CI)	P value
	Underweight	Not underweight			
	%	%	n		
Age					
18 – 33	21,4	78,6	42	1,2 (0,39-9,66)	0,95
34 – 57	18,4	81,6	38		
Gender					
Male	21,09	78,1	64	1,96 (0,39-9,66)	0,625
Female	12,5	87,5	16		
Educational background					
Low education	21,4	78,6	28	1,145 (0,36-3,56)	1
High education	19,2	80,8	52		
Employment status					
Not working	22,2	77,8	18	1,19 (0,33-4,27)	0,74
Working	19,4	80,6	62		
Marital status					
Unmarried/ divorce	16	84	50	0,52 (0,17-1,58)	0,38
Married	26,7	73,3	30		
Clinical factor					
Not in ARV Treatment	0	100	3	1,26 (1,12-1,41)	0,88
In ARV treatment	20,8	79,2	77		
Gastrointestinal symptoms					
Available	35,5	64,5	31	4,84 (1,48-15,7)	0,01
Not available	10,2	89,8	49		
Opportunistic infections					
Available	26,3	73,7	19	1,62 (0,48-5,45)	0,64
Not available	18	82	61		
Smoking Habit					
Smoking	16,7	83,3	36	1,2 (0,39-9,66)	0,95
Not Smoking	22,7	77,3	44		
Alcohol consumption					
Consume	9,1	90,9	11	1,96 (0,39-9,66)	0,625
Not Consume	21,7	78,3	69		

Smoking habit and alcohol consumption statistically did not correlate with nutritional status. The proportion of underweight nutritional status was higher on the respondents who did not smoke (22.7%). While the proportion of underweight nutritional status was also mostly in respondents who did not consume alcohol (21.7%). The multivariate analysis stage showed that the variables which had a significant correlation with nutritional status were the gastrointestinal symptoms, while the smoking habit, alcohol consumption, and food security status were the confounding variables. The result of final analysis showed that the OR for gastrointestinal symptoms variable was 4.78. It means that the respondents who experienced gastrointestinal symptoms had 4.7 times chance to be underweight compared to respondents who did not experience gastrointestinal symptoms after controlling smoking habits, food security status, and alcohol consumption. (Table 2)

Table 2. The final model of multivariate analysis

No	Variabel independent	P Value	OR	(95% CI)
1	Gastrointestinal symptoms	0,01	4,78	(1,44-15,81)
2	Smoking habit	0,58	0,71	(0,20-2,42)
3	Household food security status	0,58	1,41	(0,40-5,01)
4	Alcohol consumption	0,47	0,43	(0,04-4,30)

Discussion

Human Immunodeficiency Virus (HIV) attacks human immune system and resulting in an increase possibly of other infection and lowering nutritional status. This study showed that there was no correlation between gender and nutritional status. It could be caused by the majority of respondents in this study was male. Previous research found that the proportion of underweight nutritional status was smaller in men than women [6], PLWHA who were male had three times chance to experience over nutrition [7].

Low education background in this study was found more in respondents with underweight nutritional status. This result was in line with another study which showed that underweight nutrition status was more common in PLWHA who had low levels of education [6]. The higher level of education could ideally increase someone's knowledge and attitudes in terms of choosing food.

This study did not find any correlation between nutritional status with employment status. This was not in line with another study which showed that PLWHA patients at Cipto Mangunkusumo Hospital who did not work had 1.3 times risk of experiencing malnutrition [6]. other research states that unemployed PLWHA would lead to poverty and affecting the ability of individuals to buy food [8]. People who did not work also had a 4.97 times chance to experience obesity due to having low physical activity level [9]. Among PLWHA, discrimination and negative stigma still often occur in their offices/workspaces and even the threat of job loss was still experienced by them [10, 11].

In this study, the proportion of underweight nutritional status was higher on PLWHA who were married compared to those who were single or divorced, this could be due to the increase in household members after marriage, since Makassar City community still adopting the extended family system. Households that had more than one nuclear family or consist of 2 to 3 families in one household resulting in an increased expenditure and limited food consumption. While in another study showed that PLWHA who were not married had a 2.7 chance of experiencing undernourishment when compared to PLHIV who were married, as well as PLWHA who live alone had 3 times chance to experience malnutrition than those who live with families.

This study showed that the proportion of underweight nutritional status was higher on PLWHA who underwent ARV therapy. These results were not in line with the previous study which found that PLWHA who underwent antiretroviral therapy were mostly overweight [7]. Since the introduction of antiretroviral therapy, it had indeed suppressed the occurrence of opportunistic infections among PLWHA, obesity could be caused by an improved appetite or excessive eating habits.

Treatment for antiretroviral therapy must be supported by adequate food intake [12], studies related to antiretrovirals indicate that lack of food intake could harm the pharmacokinetic effects of protease inhibitor-based drugs [13]. Another study at one of the Ethiopian hospital's ARV services showed that PLWHA who had BMI < 18.5 kg/m² when starting ARVs treatment was associated with risk of death especially in the first three months of treatment. This could occur because of the effects of immune system dysfunction due to malnutrition, and the burden of opportunistic infections being higher [14]. With antiretroviral therapy, excessive weight loss was less common in PLWHA who were taking antiretrovirals [15].

This study showed the correlation between gastrointestinal symptoms (such as nausea, vomiting, diarrhea or lack of appetite) and nutritional status. Another study also showed the association between gastrointestinal symptoms and malnutrition status [8]. HIV infection affects nutritional status by reducing food intake and absorption of nutrients due to an increased demand or utilization of protein, protein excretion and other micronutrients in the body. Other research also showed that patients with gastrointestinal symptoms such as chronic diarrhea, vomiting, and loss of appetite had been shown to significantly threaten the nutritional status of PLWHA.

The analysis found no significant correlation between nutritional status with opportunistic infections. Opportunistic infections were independent risk factors for malnutrition, weakening the immune system caused by HIV and also increasing the risk of other infections that worsen nutritional status [8]. Handling of patients with opportunistic infections immediately was very important, in the same study the occurrence of opportunistic infections was significantly related to weight loss, so the presence of antiretroviral therapy greatly helps health status and quality of life among PLWHA.

The analysis showed that there was no correlation between smoking habits and nutritional status. Smoking was a serious public health problem throughout the world and had become an epidemic that not only affected public health but also economy and environment [7]. In this study, the nutritional status of underweight was

higher on PLWHA who did not smoke, this result could be due to other factors such as opportunistic infections and gastrointestinal symptoms so that even though the respondents were not smoking, weight loss could occur. This study also did not find a correlation between alcohol consumption and nutritional status, this could be due to the small proportion of respondents who consumed alcohol.

Consuming alcohol in both infected and uninfected people could affect the immune system by altering the production of molecules that function as signals (cytokines) to coordinate the body's defenses. The result was the susceptibility of the body's defense against bacterial infections, such as pneumonia or tuberculosis. Excessive alcohol consumption was also associated with vitamin A and vitamin C deficiency [16], the level of fat in the liver will gradually increase and result in the liver had to work more than it should to deal with excess fat that was not soluble in the blood. Other effects of excessive alcohol consumption would also increase the risk of alcohol dependence, cardiovascular disease including high blood pressure, obesity, stroke, and some cancers.

Gastrointestinal symptoms were the dominant factor related to the nutritional status of people living with HIV/AIDS (PLWHA) at Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar City. Gastrointestinal symptoms (GIS) were digestive disorders such as diarrhea and lack of appetite that could cause malnutrition among people living with HIV/AIDS [16].

Conclusion

Based on the results of the study conclusions can be drawn:

1. Nutritional status of people with HIV/AIDS (PLWHA) was mostly normal (67.5%), followed by underweight (20%) and overweight (12.5%).
2. Bivariate analysis showed that *gastrointestinal* symptoms was correlated with nutritional status on PLWHA
3. Multivariate analysis showed that the dominant factor associated with underweight nutritional status was gastrointestinal symptoms with OR 4.78.

Suggestion

Suggestions that could be delivered based on the results of this study were:

1. Providing education in terms of improving and maintaining diet and nutrient intake due to gastrointestinal symptoms in PLWHA especially in Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar City.
2. For the government to pay more attention on health services for PLWHA, especially related to antiretroviral therapy treatment services.
3. For observers of HIV / AIDS and future research to deepen research related to obesity on PLWHA.

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Family Planning's Village: A Real Role in the Efforts to Improve Family Empowerment

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Abstract

The Family Planning Village Program as known as 'Kampung KB', is one of the government's innovation programs in strengthening the Family Planning and Family Development program by narrowing the scope of the target is at the regional or village level. This study aims to analyze the implementation of the program in Tanjung Gunung Village, Pangkalan Baru District, and also the obstacles. This type of research was qualitative with a case study approach. Subject selected by purposive sampling method. Data collected by in-depth interviews. Data was analyzed by content analysis methods. Referring to all indicators that all levels of both the implementers and also the target activities related to the information provided is not up to date and not yet clear enough. The available resources are inadequate, while the disposition given has not been responded to very well, so that the elements of the community themselves are less willing to respond or lack of their awareness. Judging from the organizational structure, the program has not been carried out in accordance with the technical manual guidelines, and the tasks given have not been carried out in accordance with the existing of SOPs, then accounted for in the form of unscheduled and organized reports. The conclusion is that not all input, process and output indicators have been fulfilled. The suggestion of this research is the need for a shared awareness that Kampung KB is a shared property and with an increase in the Quality of human resources, various concerns of life regarding issues related to Population Family Planning and Family Development Program (KKBPK). It is also need to create a standard reporting system to implement these activities.

Keywords: *Family Planning Program, Kampung KB, Cross Sector*

Introduction

Population is the basic capital in realizing sustainable development. Good development can only be realized by a good quality population, which of course depends on the large population. Large population with a fast growth rate and low quality would certainly complicate the achievement of development goals and cause problems in increasing population. The problem of increasing population is an important problem experienced by many developing countries, including Indonesia.

Responding to the problem of increasing population, the Indonesian government then focused on running the Family Planning program. In Indonesia, it began in the New Order (1971) and has been proven to be able to suppress the rate of population growth in Indonesia. The population of Indonesia is currently moving rapidly and resulting in higher unemployment and poverty rates. Basically the results of the FP program are useful for the development of Indonesian society itself. Efforts to continue to maximize the implementation of FP programs would be an absolute choice for the current government ¹. Law Number 52 of 2009 concerning Population and Family Development as the basis for the implementation of the Population and FP Program suppresses the authority of the BKKBN not to focus on population control issues but also on FP development issues as well. The Government of the Bangka Belitung Province has collaborated with the BKKBN of the

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Bangka Belitung Province to form since 2016². The Program is one of the movements to build villages and is included in the poverty reduction program. 'Kampung KB' aims to improve the quality of life of the community at the village level or equivalent through the KKBPK program and the development of related sectors in order to realized quality small families³. Based on data from the BKKBN Bangka Belitung Islands Province, the number of 'Kampung KB' that has been formed up to 2017 is 54 villages.

Method

This study uses a qualitative approach with explorative study research methods. The sample was selected by purposive sampling method. Data were collected by in-depth interviews with key informants such as Head of Central Bangka FP, and FP Field Officer, while the triangulation informant is Community village. As a process, indicators of the achievement model are not merely looking at results, but success is also based on inputs, processes and outputs.

Results and Discussion

Administratively, the number of cadres in one working group has fulfilled the requirements, but technically the implementation of the cadres who work has not yet fulfilled the requirements because there are still many cadres whose tasks are also double. The FP Field Instructor assigned to foster Central Bangka Regency not only fosters one village, but there are 5 villages that are fostered so that it becomes less effective and less focused in carrying out coaching so that it hinders the success of the program. According to Pasrah (2014), factors that hamper the success of the FP program include the low level of resources owned by agencies related to the implementation of the FP program⁴. According to Grestina (2013), one factor hampering the success of FP programs is the lack of FP field officers which results in a lack of socialization and counseling about FP programs⁵. The funds used in the activities come from the Regional Budget of 20 million rupiahs for each city. In the technical guidelines for the formation, the budget is provided by the BKKBN for the process of forming and the stimulant fund is allocated by Provincial BKKBN representative⁶.

Indicator of input success that has not been achieved is the budget for activities that run in the 'Kampung KB'. Operational financing is sourced from APBD II and existing local potentials such as Corporate Social Responsibility fees and others³. The activity was not running, so no funds were generated to implement the program. The form of empowerment used in the program is participatory empowerment. The Head Village is only tasked with monitoring ongoing activities. According to Basri (2013), the provision of appropriate training is very effective to maximize community empowerment activities⁷.

This research takes his theory Edward III, which explains the factors of successful policy implementation can be seen from communication, resources, dispositions and bureaucratic structure. Some activities that have been carried out as the implementation from various cross sector:

1. Increase active modern FP participants. It is carried out by FP cadres consisting of 5 members which is in charge of providing information to people who want to use FP in collaboration with the Public Health Care at village whereas Midwife as a FP service provider.

2. Improving family resilience through Toddler Family Development, Youth Family Development, Elderly Family Development and Youth Information and Counseling Centers. Cadres as implementers at the bottom line are resources that need to be supported with adequate methods, mechanisms, funding and training as an effort to strengthen cadre steps in the field.

3. Increase family empowerment group. Until now there has not yet been formed a group, because the community members have their own activities and interests to improve their welfare so that the group has not yet been formed.

4. Improve the degree of public health. It is carried out in the form of health education and outreach involving the Health Center. Some of the activities that have been carried out include: Pregnant mothers and toddlers classes, Examination of the health conditions of women of childbearing age, IVA tests, Anti-anemia Campaign and Sexually Transmitted Infection for pregnant women.

5. Improving village development facilities and infrastructure by looking at several families that do not have clean water sources, do not yet have sewerage (sanitation), unsuitable houses, households without final disposal, and sports facilities that inadequate.

6. Improving sanitation and a healthy and clean village environment. To improve the condition of the Family Environment that meets the Healthy Environment Standard, no one has yet provided intervention. So there are still some family environmental conditions that do not apply healthy environmental standards.

7. Improving the quality of the faith of adolescents / students in religious activities (Islamic school, worship groups / prayer groups / religious lectures) in the youth group is carried out by the FP Population Control Office for Women's Empowerment and Child Protection related to strengthening youth integration groups.

8. Increase the sense of nationality and love of the homeland of youth / students in socio-cultural activities in the youth or student groups. Nationalism and patriotism were intervened by the Health Office through the provision of Communication Information Education and counseling for adolescents related to Marriage Age Maturity.

Discussion

1. Communication

Communication is needed to coordinate all parties related to the policy that will be applied starting from the uppermost to the lowest position. If the goals and objectives of a policy are not clear then there is a possibility that there will be mistakes in various ways so that the implementation of the policy will not be implemented properly.

Effective communication can affect a person's behavior. This is consistent with the results of research from Suroso (2014), which states that intensive communication between fellow citizens, between community members and their leaders and between social systems within the community and outside systems is able to increase the role and participation of the community⁸.

In accordance with the procedures and also refers to technical manual. Moving away from that, the advocacy group has conveyed information clearly, but the problem that arises is that the understanding captured by the community is still largely lacking. It was proven that the participants who participated in the activity were still minimal, even though the number of participants increased. From the results of Ariesta's research (2011), the thing that becomes an obstacle in coaching the toddlers are the limited time and existing cadres so that the activities are less effective and the time for implementing activities is less efficient⁹.

According to Nurharjadmo (2008), a good understanding of the program has an impact on the attitude taken by the implementers of the policy. The socialization activities on family planning villages are carried out by the city government to cadres and community leaders in the area. All cadres and community leaders who will later become implementers of the family planning village program will attend the socialization activity¹⁰.

According to Naufal (2010), said that the inhibiting factor of program implementation is the absence of specific guidance from agencies, some people do not all know about the program and time constraints¹¹. The Chairman has an important role and function in carrying out the program. The roles are as follows: a) Determine policy and program activity strategies; b) To guide and foster all of group administrators; c) Coordinate with all parties. According to Kasmel and Pernille (2011), said that the interest and initiative of the community regarding the importance of existing problems, political, financial support and policy makers are very important in achieving the goals of community empowerment¹².

2. Resources

Resources have three sub-indicators therein which are used to support the successful implementation, including: Human resources, budget resources, and also facility resources.

Human resources are one of the factors in supporting the success of a program. Human resources have no shortcomings because 20 cadres participated and also support from religious and community leaders as well as from village official was sufficient to

implement the activities. According to Lahijani (2012), stated that the factors influence empowerment in human resource development projects include the existence of self resources and self-ability in the form of modeling, motivation, and support¹³.

Budget resources are involving issues regarding funds or initial capital that have been planned beforehand in a certain period of time which will later be allocated in an activity. The results of the research related to the budget used are sufficient to cover the funding needs that exist during ongoing process. The budget itself comes from village, local government and also from the Provincial BKKBN.

Facility resources have an important role in supporting and running the program. This has been explained by the fact that the facilities are one of them, namely the place. The place used during FP activities is the house of a resident, sometimes also used is in the hall. Not only the place, other facilities and infrastructure are also provided such as counseling books intended for cadres' mothers to provide guidance to the community. According to Merrynce (2013), the dominant factors influencing the effectiveness of family planning programs are the communication and resource factors¹⁴.

3. Disposition

Disposition itself is formed from two sub-indicators namely attitudes and incentive. Sub-indicators of a positive attitude will occur that have coordination and sustainability between the implementer and the community. The research shows that the attitude given by the implementers that are FP officers and Cadres activities.

However, there are several obstacles related to the attitude given by the cadres, namely the lack of a personal approach to the participants with the cadres. Based on Febriansyah's research (2015), the lack of cadre knowledge about FP programs, resulted in cadres not being able to determine attitudes to targets because cadres were afraid of something negative¹⁵.

Related to this problem, also makes the lack of parental supervision of their children. This triggers a lack of awareness among some of the community about the importance of the program so that there are still

problems including the number of dropouts or not going to school. According to Suminar (2012), the higher level of self-control, the lower the juvenile delinquency behavior. However, the provision of such material was only done at the beginning after the formation of the FP village¹⁶.

4. Bureaucratic Structure

There are two sub-indicators in the bureaucratic structure; the first is the Standard Operating Procedures that are used as guidelines in implementing a program.

Standard Operating Procedures are used as a reference steps or stages of action to be taken during the implementation process of an activity. The SOP is not going well, it is used in the form of a technical manual for the implementation of the 'Kampung KB', starting from the beginning of the activity to the final stage.

Fragmentation sub-indicator is the division of tasks, obligations, and authorities associated with a program. In this case, fragmentation in the implementation of the program has not been good. All the tasks and authorities that have been given are carried out in accordance with existing procedures from the District Health Office, FP officers and cadres have carried out their respective duties in accordance with the technical guidelines for the implementation.

The overall policy implementation is evaluated by measuring program outcomes based on policy objectives. Program output is seen through its impact on the intended target of individuals, groups and the community. According to Akib, the outcome of policy implementation is change and acceptance of changes by the target group¹⁷.

Conclusion

'Kampung KB' Cadres as implementers at the bottom line are resources that need to be supported with adequate methods, mechanisms, funding and training in an effort to strengthen cadre steps in the field. The implementation of training and regular gatherings as a means of improving the quality of human resources is absolute because if the 'Kampung KB' is only meant as a declaration then it will most likely not survive in the future. Therefore, the cooperation between the local government officials and the Health Office in providing

training and monitoring of periodic evaluations will help improve the capacity of human resources and be able to capture the problems faced by FP Officers and Cadres in the implementation of the post-declaration.

Additional Informations

Conflict of Interest Statement: The authors have no conflict of interest to declare.

Source of Funding: All funds used to finance all research activities and publications of research articles come from Health Polytechnic of Pangkalpinang.

Ethical Clearance: Ethical approval recommendation for this study taken from Ethics Committee of Health Polytechnic of Pangkalpinang, Indonesia with number No.05/EC/KEPK-PKP/2018

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Inclusive Higher Education with Mentoring - a road map for Medical Career Choice

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Abstract

UNESCO promotes Inclusive Education systems that remove the barriers limiting the participation and achievement of all learners, respect diverse needs, abilities and characteristics and that eliminate all forms of discrimination in the learning environment. Recent research shows an annual increase in the number of students with learning and other disabilities to higher education institutions. The purpose of getting admitted to a higher education institution is not mere completion of a degree, but finding a suitable career and overall development as an individual, which is not simple to achieve. The word *Mentor* evolved to mean trusted advisor, friend, teacher and wise person from the famous epic Odessy. India being a country with diverse landscape, culture, language and heritage, the challenge becomes more complex. Different boards in India offer school education both in English and vernacular languages. With a view of offering social justice and equal opportunity, reservation policy is strictly followed both in education and in employment. The current paper aims at finding out the challenges in higher education, career choice and role of mentoring for an effective inclusive society. To gauge the gap in and the impact of mentoring, the researcher has identified the final year higher secondary students of different boards and the entry-level UG students in medical education among Trichy and Tanjore districts in Tamil Nadu. The present study reveals that students of entry-level UG medical education have stressed the need for mentoring at school level for effective choice of career.

Keywords: *inclusion, the challenge in education, higher education, career choice, mentoring*

Introduction

As per UNESCO's definition Inclusive Education is "a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion from education and from within education." With increasing effort towards equal participation of all students irrespective of social background, disability status, language and other limiting factors, inclusive education has gained its importance in India. According to the recent statistics from UNESCO¹⁷, about 75% of children below 5 years and 25% children from 5 to 19

years don't attend to schools, out of 2.27% disabled population in India, (according to 2011 census survey). In India, different boards offer primary, secondary and senior secondary education both in English and in vernacular medium. In Tamil Nadu, where the study was conducted has about 37211 government, 8403 government-aided and 12419 self-financing schools where students learn with state board syllabus, a majority in Tamil medium. With a key focus on students aspiring for medical education, with a recent introduction of NEET examination to get admitted to medical colleges and the limited number of medical graduation seats in Tamil Nadu under government quota (about 3200 seats in 23 state government-run medical colleges) career choice becomes more complicated.

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Statement of the problem

Factors like National Council of Educational

Research and Training (NCERT) syllabus being the base for National Eligibility cum Entrance Test (NEET) examination, a wide difference between the syllabuses offered by state and central boards, reservation policy, level and type of disability all influence a medical aspirant's achievement level. This study aims at studying the challenges in higher education, career choice and role of mentoring for an effective inclusive society.

Review of Literature

Wolffe, K. (1999)¹ has identified that mentors broaden the career potential of mentees, especially those who are separated from the society due to conditions like being minority or differently abled. Ragins, B. R., & Cotton, J. L. (1999)² have emphasized that the mentoring outcomes are better if the mentor and the protégé are of same gender. Also, informal mentoring prove to be more effective in terms of being a role model than formal mentoring. Gray, M. A., & Smith, L. N. (2000)³ emphasise the need for a good mentor who would provide role clarity, be good role models and guide to the students. Nursing students participated in this research have emphasised the need for a good mentor and expressed their own willingness to be good mentors in future with qualities like spending quality time with the mentee, having a sound knowledge of the field, be patient, being a good teacher, etc. Liang, B., et.al. (2002)⁴ reveal that apart from basic functions like teaching, if mentors are more authentic, give way for empowerment and mutual engagement, mentoring would lead to positive developmental outcomes. Crawford, K., & Smith, D. (2005)⁵ have revealed that mentoring influence career choice and development, especially among African minority women among whom this study was conducted. It also leads to personality development, advancement in career and educational betterment. Singal, N. (2006)⁶ emphasises on understanding the concept of inclusive education to apply it in the present education system in India. Parasuram, K. (2006)⁷ reveals that more than any other factor, teacher's prior experience with a disabled person has more impact on inclusive education. Budge, S. (2006)⁸ explores the different forms of mentoring and the effectiveness of mentoring based on the form it is being offered. Eby, L. T., et.al (2008)⁹ reveal that among youth, academic and workplace mentoring, academic and workplace mentoring prove to have more favourable outcomes when compared to youth

mentoring. Also, mentoring is proved to have positive relative relationship with these favourable outcomes. Angelides, P., & Mylordou, A. (2011)¹⁰ focus on the impact of mentoring on newly appointed teachers to deal effectively with the different sectors of students and their diverse needs. Gupta, A., & Gowda, M. R. (2012)¹¹ have found that formal mentoring programme would help youth to be more empowered, abled and competent. This study also proves that formal mentoring programmes are more useful among youth where the communities and families are not able to provide relevant information about higher education and opportunities. Das, A. K., et.al. (2013)¹² after examining the current and perceived skill levels of primary and secondary school teachers in Delhi reveals that about three-fourths of the teachers neither received training to work with nor have dealt with special need children. Also, more than three-fourths of the teachers have no access to special resources to work with these children. Eesley, C. E., & Wang, Y. (2014)¹³ have revealed that the mentorship programme offered by entrepreneurs had a positive influence on the higher education students when compared to the one offered by non-entrepreneurs. Jyoti, et.al. (2015)¹⁴ reveal that mentoring has a significant impact on career development among call centre employees. Sulphrey, M. M., & Allam, Z. (2017)¹⁵ have found that mentoring programme at higher education level helps the youth to enhance their academic performance and to get employed. Singh, S. A. T. E. N. D. R. A. (2019)¹⁶ points out the inability of the special need children to achieve their medical education aspiration under the Medical Council of India's new guidelines, when their disability exceeds certain limits, not allowing them to pursue medical education especially to become medical practitioners even after being successful in NEET.

Methodology

The design of the study was descriptive in nature. This study included 20 students each from second year higher secondary education from central board, 20 students each from Tamil and English mediums of the second year higher secondary education from state-board and 20 students each from two government medical colleges from the first year medical graduation. The samples were collected from Trichy City Corporation and Tanjore Municipal Corporation, where urban children are expected to get exposed to majority of the

available resources. The data were analysed using one way ANOVA and multiple regression using SPSS.

Data analysis and Findings

The demographic details of the respondents included gender, community, parent occupation, board and medium of study, disability status, geographical area of residence and school. An overview of the demographic details is as follows:

Table 1- Demographic details of the participants

Factor	Categorization			
Gender	Male	Female		
	45	55		
Higher Secondary Board of Education	Central Board	State Board		
	37	63		
Occupation of the parent(s)	Medical profession		Non-medical profession	
	15		85	
Medium of study	Tamil	English		
	22	78		
Geographic area of the school	Rural		Urban	
	17		83	
Geographic area of residence	Rural		Urban	
	26		74	
Community	OC	OBC	SC	ST
	22	74	3	1
Disability Status	Person with disability		Person without disability	
	4		96	

#Source: Primary Data

Out of 100 respondents, more than half of the respondents are females and are studying in state board syllabus. A considerable number of respondents are from urban background and study in schools situated in urban areas. Majority of the respondents' parents are engaged in non-medical professions. A contingency table was

created using Analysis of Variance (one way ANOVA) with demographic and other factors influencing career choice as a medical aspirant.

Table 2- Cross Table Analysis – Analysis of Variance (One Way ANOVA) - Demographic and other

Factors affecting Career Choice as Medical Aspirants

S. No	Constructiveness of the student		Parent profession		Academic Aspiration		Career Choice decision		Role of a Mentor	
	SIF	Outcome	SIF	Outcome	SIF	Outcome	SIF	Outcome	SIF	Outcome
Gender	.259	A	.073	A	.326	A	.042	R	.023	R
Board of Education	.724	A	.033	R	.491	A	.512	A	.006	R
Medium of Education	.562	A	.044	R	.650	A	.622	A	.040	R
Community	.020	R	.223	A	.010	R	.010	R	.049	R
Geographic Area of The School	.051	A	.037	R	.726	A	.077	R	.034	R
Geographic Area of residence	.049	R	.003	R	.098	A	.891	A	.010	R
Parent income	.055	A	.021	R	.047	R	.992	A	.056	A

Using One-way ANOVA, the demographic variables gender, board and medium of education, community, parent income, geographic area of the school and residence were compared with the other variables influencing career choice. From the five factors, the factor career choice and role of a mentor have revealed that there is a significant difference with gender. The factor parent profession and the role of a mentor showed that there is a significant difference with the board of education. The factor parent profession and role of mentor revealed that there is a significant difference in the medium of education. The factor constructiveness of the student, academic aspiration, career choice and role of a mentor revealed that there is a significant difference with the community. The factor parent profession, career choice and role of a mentor revealed that there is a significant difference with the geographic area of the school. The factors constructiveness of the student, parent profession and role of a mentor showed that there

is a significant difference with the geographic area of the residence. The factor parent profession and career choice revealed that there is a significant difference with the parent income.

$$Y = a + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5$$

Y = Career Choice

x1= Constructiveness of the student

x2= Parent Profession

x3= Academic Aspiration

x4= Career Choice Decision

x5= Role of a Mentor

Null Hypothesis (Ho) - There is no significant impact of the constructiveness of the student, parent profession, academic aspiration, career choice decision

and role of a mentor towards career choice.

Table 3 – Multiple Regression Analysis – Factors influencing Career Choice

Categories	Size	Constant	Regression co-efficient					R Square Value	F
			x1	x2	x3	x4	x5		
Factors	100	0.43	.015	.065	.023	.045	.221	.695	16.232

*Indicates 5% level of significant

Figures in the parenthesis are “t” values

Multiple regression is done to find out the influence of five factors over career choice. The worked out F value (16.232) shows that the regression model suited for analyzing the career choice is significant. The R square value (.695) makes it clear that total variation in the dependent variable career choice which can be explained by the independent variables by 69.5%. The P-value = 0.000 which points out that the model is significant. The Multiple regression co-efficient reveals that, out of five components, the constructiveness of the student, academic aspiration and career choice decision have a significant impact over career choice. The other components such as parent profession and role of a mentor have no significant impact on career choice.

Conclusion

The very basic objective of this study was to check the association between the constructiveness of the students, parent profession, academic aspiration, career choice decision, role of a mentor and career choice among medical education aspirants. The outcomes of the study brings to an end that there is a significant difference between the above five components and career choice. Also, there was distinctness found in the observed levels of career choice concerning demographic variables such as gender, board and medium of education, parent income, geographic area of the residence and the school. The findings contribute to the understanding of career choice among medical education aspirants and will support them for better guidance. So, to conclude that the role of a mentor is very vital in career choice,

especially in medical education aspirants, whether formal or informal.

Ethical Clearance: N/A

Source of Funding: Self

Conflict of Interest: Nil

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The Time Interval in Patients Care Process of Colorectal Cancer A Hospital based Study in Khon Kaen, Thailand

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Abstract

Background: Colorectal cancer (CRC) is the fifth common cancer in Thailand. Waiting time is a problem within the cancer management and may lead to poor results of cancer. This study aimed to explore the time interval during the process of CRC management.

Objective: To determine the time interval throughout the patients care process of CRC in a hospital in Khon Kaen, Thailand.

Methods: A cross-sectional descriptive study of 191 CRC participants who undergoing treatment and CRC confirmed with pathology examination in the tertiary hospital in Khon Kean Province. Data were collected by structured interview and medical record. The time interval in each process of CRC reported by median and interquartile interval (IQI).

Results: Median (IQI) of the time interval for diagnosis was 246 days (114-426 days). The longest time interval which accounted among the waiting time process was health system delay 89 days (27-221 days). Some factors differ in the time interval; the tertiary hospital at the first time, female, young patients, and lower-income had longer waiting time.

Conclusions: In conclusion, this study showed that health system delay accounted for most of the time interval for the process of CRC management. For this issue, a shortening time interval for initial investigation was necessary. If the patient delay was to reduce, we needed promotion about knowledge of the first symptom that was related to CRC and rising patients' awareness of cancer.

Keywords: Time intervals, delay diagnosis, colorectal cancer

Introduction

Colorectal cancer (CRC) is the most common

diagnosed and cause-related to deaths worldwide. New cases over 1.8 million and 880,792 death in 2018.³ In 2030, the expectation of the new cases of CRC will be a 60% increase to nearly 2.2 million and 1.1 million deaths.² In Asia, the trend incidence of CRC will be increasing and accounted for approximately 45% of worldwide.⁴

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In Thailand, CRC is the most common cancer in both sexes. The age-standardized incidence rate (ASR) = 15.2 per 100,000 population in males and ASR = 10.1 per 100,000 population in females.⁹ The data from the Khon Kaen population-based cancer registry showed that the ASR=13.1 per 100,000 population in males and the ASR=9.0 per 100,000 population in females.¹⁴

The time interval in cancer management will be increasing, especially for CRC²¹ that reported increasing duration from first visit general practitioner (GP) until diagnosis about 10-25% of the five most common cancers. Furthermore, a longer period in primary care in CRC associated with increasing time to diagnosis.¹³

Delayed diagnosis is important to determine the prognosis of cancer. The shortened delays diagnosis interval related to providing the proportion of early stage of cancer¹ and reducing clinic pathway or fast-track diagnosis and treatment that was allowing patients or pre-cancers to access treatment promptly.¹⁸

The time interval of the CRC process is crucial, and few studies implicate the waiting time in CRC were done. This study aims to investigate the time interval in patients care process of CRC: a hospital-based study in Khon Kaen, Thailand.

Materials and Method

Study population

This study uses a cross-sectional descriptive study. The population of this study was the CRC patients who underwent treatment at a super tertiary hospital. The participant defines according to the International Classification of Diseases for Oncology (ICD - O 3rd edition) from C18.0 for Cecum to C20.9 The CRC participants who undergoing treatment and histological confirmed and able to communicate and consented to participants were eligible for inclusion. The patients with metastasis or physiological or psychological problems which affected their ability to answer the question were excluded.

Definition

We defined the time interval as outcome into four sections. (1) Patient delay (PD): the first symptom presentation until first visit their GP; (2) Health system

delay (HD): the first consultation with their GP until the diagnosis of CRC; (3) Treatment delay (TD): CRC diagnosed until received first treatment; (4) Time intervals for diagnosis (TID): the first symptom presentation until confirmed diagnosis by histological report (Figure 1).

Data collection

We collected the data from interviewing all participants by structured interview and medical record.

Statistical analysis

Descriptive statistics were analyzed and presented as number and percent for categorical data and mean, SD for continuous data. The results interpreted as median in days and interquartile interval (IQI).

The sample size required minimum of 193 patients was calculated from the formula for multiple linear regression

$$f^2 = \left(\frac{R_{t/\epsilon}^2}{1 - R_{\epsilon}^2 - R_{t/c}^2} \right)$$

Cohen's determine magnitude of effect size which encloses: 0.02 = small, enclose 0.15 = medium, enclose 0.35 = large. In this study, a certain effect size (f^2) nearly 0.15

$$n = \frac{\lambda(1 - R_{T,A}^2)}{R_{T,A}^2} = \frac{\lambda}{f^2}$$

Results

Demographics of study subjects

A total of 191 CRC patients and incomplete data for two subjects were excluded. Most of subjects were males and mean age was 61.28 (\pm 10.18) years old. Highest education level was below primary school (32.98%) and bachelor or higher (32.46%). Also, majority of health insurance was the civil servant medical benefit scheme (CSBMS) (Table 1).

The time interval throughout the patients care process of CRC

The result showed that the median (IQI) of TID, PD, HD and TD was 246 days (114-426 days), 61 days (16-184 days), 89 days (27-221 days) and 18 days (0-41 days), respectively.

The median (IQI) of HD seems to longest period

when compared with PD and TD.

Discussion and Conclusion

The time interval for diagnosis (TID)

The median (IQI) of TID was 246 days (114-426 days). It was nearby the median SDI was found at 102-217 days.^{7-8,19} As the results from the Denmark showed that the median (IQI) of total delay was 109 days (65-194 days).¹² Even though, the time interval in this study seems to be longer than the previous studies, which were developed countries.

Patients delay (PD)

The median (IQI) of PD was 61 days (16-184 days). The previous studies reported the median (IQI) of PD which was 28-150 days^{7,12} and the mean was 106 days¹⁵ and 37% rectal cancer patients were delayed >3

months.¹⁰ 486 (60.6%) people who spent the time to see medical for a week. The average duration to see CRC medical was 1.9 (± 2.31) weeks.¹⁶

Health system delay (HD)

The median (IQI) of HD was 89 days (27-221 days), when compared with other countries, a median (IQI) was 67 (28-132).²² Two other studies reported the median of HD was 17 (8-39) weeks and 40 (23-71) days.^{17,23} Length time in HD of our finding was quite long when compared with other studies.

Treatment delay (TD)

The median (IQI) of TD was 18 days (0-41 days). Other studies reported the median was 22-37 days, median (range) was 7 (1-361) days and the mean (SD) was 15.9 (27.6) days.^{7-8,20} In breast cancer,

Table 1. Baseline characteristics

Variable	Number (n = 191)	Percentage
Gender		
Male	118	61.78
Female	73	38.22
Age (years)		
<40	7	3.66
40-49	16	8.38
50-59	47	24.61
>=60	121	63.35
Mean (SD)	61.28 (± 10.18)	
Median (Min:Max)	62 (24 : 89)	
Education level		
Below primary school	63	32.98
Primary school	23	12.04
Highschool/Diploma/equivalent	43	22.51
Bachelor or higher	62	32.46
History of cancer in family members		
Yes	81	42.41
No	110	57.59
Frist health care visit		
Primary health care	5	2.62

Cont... Table 1. Baseline characteristics

Secondary Hospital	73	38.22
Tertiary Hospital	49	25.65
Private Hospital	64	33.51
Insurance		
Nothing/Self-pay	11	5.76
CSBM ^{S*}	116	60.73
SSS [†]	3	1.57
UCS [‡]	55	28.80
Other	6	3.14
Stage of CRC (n = 175)		
Stage I	14	8.00
Stage II	52	29.71
Stage III	53	30.29
Stage IV	36	20.57
Unknown	20	11.43

*The Civil Servant Medical Benefit Scheme (CSBMS)

†The Social Security System (SSS)

‡The Universal Coverage Scheme (UCS)

lung cancer, colorectal cancer and upper GI cancer were 8-15 days, 10-25 days, 6-14 days, and 7-13 days, respectively.⁶ The period time in TD of our finding seem

to the other studies.

The reasons that can explain, we conducted in a university hospital that could affect the results because most of the patients who come to service were CSBMS. These patients had more opportunity to access to health services than other groups. Measurement of the date of first symptom presentation was less precise. PD was reflecting in which the patients had different in symptom awareness or health-seeking behavior.²

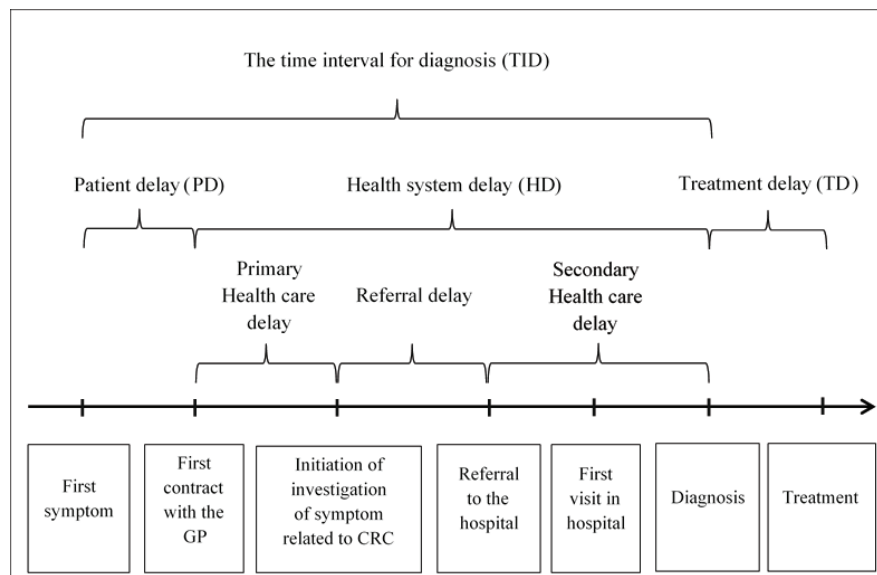


Figure 1. The time intervals in the patients care process

The problem solving was asking the reference date that was a major Thai holiday/event or season. This method can help the patients to remind the date of the event. There were differences in health systems. In many developed countries, there were fast-track and more alternatives to access services in a variety of health facilities. For example, they can visit to specialist without waiting to referral by GP. In Sweden, the patients usually pay the same whether you choose a private or public clinic or hospital.¹¹ The results from our study showed that the patients who visited private hospitals most likely had shorter waiting times for diagnosis than government hospitals.

The strength of this study, the investigators had interviewed all participants and medical record was used to determine the accuracy of data and prevented recall bias. Moreover, we had more information by interviewing the patients.

In conclusion, improving the initial investigation was necessary for HD. We needed promotion about knowledge of the first symptom that was related to CRC and rising patients' awareness of cancer. The future research in large populations and factors associated with time intervals would better explain the burden.

Conflict of Interest: No conflicts of interest to declare.

Source of Funding: The Funding for Supporting Lecturer to Admit High Potential Student to Study and Research on His Expert Program 2016, Graduate School, Khon Kaen University, Thailand

Ethical Clearance: This study was approved by Khon Kaen University Ethics Committee for Human Research based. The reference number is HE 611258.

Acknowledgement

We would like to thank following: (a) Srinagarind Hospital, Khon Kaen, Thailand; (b) The Khon Kaen cancer registry (KKCR) for colorectal cancer data.

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COVID-19 Decimate from Elderly Smoker Male within 19 Days: A Case Report

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Abstract

At the end of 2019, a number of pneumonia cases have been reported in Wuhan, China, a novel coronavirus (SARS-CoV-2) was quickly identified as a potential etiology. Coronaviruses are known to cause infection mostly in the respiratory and gastrointestinal tract in human and highly contagious person-to-person transmission.

Elderlies, smokers and individuals with chronic illnesses are more susceptible to COVID-19 and are more likely to have complications such as pneumonia and even death. However, we reported a smoking elderly with hypertension infected with COVID-19 confirmed by rRT-PCR that recovers without having signs and symptoms. Lymphopenia, which considered a danger signal for COVID-19 patients, has been detected from the patient and he remains healthy during the course of infection. We believe several factors may involve that our patient did not have any symptoms one of them might be BCG.

We notice quarantine and isolation are effective in the identification and prevention of the spread of SARS-CoV-2 in population. We suggest that early diagnosis of COVID-19 is a key to preventing death. Since there is not active vaccine or treatment Immunity plays the greatest role in eliminating the infection. So boosting immunity is critical as many studies suggest.

Key-words: SARS-CoV-2; COVID-19; Coronavirus; Elderly

Introduction

At the end of 2019, a number of pneumonia cases have been reported in Wuhan, China, a novel coronavirus (SARS-CoV-2) was quickly identified as a potential etiology. Coronaviruses belong to coronaviridae family which are enveloped non-segmented positive-sense RNA. Coronaviruses are known to cause infection mostly in the respiratory and gastrointestinal tract in human. Since epidemiological investigations revealed highly contagious person-to-person transmission of

SARS-CoV-2, with a certain mortality rate^{1,2} the World Health Organization declared a public health emergency of international on 31th of January 2020. As of March 31, 2020 over 754,948 confirmed cases of COVID-19 have been reported worldwide with 36,571 confirmed death³.

The majority of the patient's symptoms were fever and cough other symptoms include shortness of breath, fatigue, runny nose, sore throat and diarrhoea. The incubation period of SARS-CoV-2 is generally 3–7 days but no longer than 14 days in rare cases 20-27 days, and the virus is infective during the incubation period⁴.

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Currently there is no active vaccine or/and drug that can be used for prevention or/and treating COVID-19 disease. Many antiviral drugs have been used in vitro and were effective against the SARS-CoV-2 virus. However,

none of them were effective against active infection and did not stop viral replication and dissemination ⁵.

Case Presentation

On March 9, 2020, a 67 years old male was quarantined for having contact with confirmed SARS-CoV-2 carrier. After two days of exposure he got the virus confirmed by rRT-PCR of a nasopharyngeal and oropharyngeal swabs. He has disclosed that he smokes cigarette and medical history show that he has hypertension with no history of other chronic illnesses. According to WHO's standards every three days the test was repeated all show positive until March 30, 2020, the rRT-PCR show negative for SARS-CoV-2. The test was

repeated after 24 hours and was negative again. During that time he did not experience any discomfort, his vital signs were normal and surprisingly, he did not show any symptoms including fever and cough. Moreover no treatment has been used except supplements vitamin C and D. At the time of discharge a blood test (complete blood count CBC) was performed to check his blood parameters. The test was normal for all parameters as shown in table 1 except for Granulocyte that was higher than the normal range and lymphocyte percentage that was lower than the normal range. After discharge on 31 March, he put under surveillance and quarantine at home, this will continue for 14 days and he will be tested and followed up regularly.

Table 1 represent the CBC of the patient before discharge

Parameters	Result	unit	Normal range
White blood cell count (WBC)	11.9	10 ³ /μl	4.0 – 12.0
lymphocyte (LYM)	2.0	10 ³ /μl	1.0 – 5.0
Monocyte (MON)	0.7	10 ³ /μl	0.1 – 1.0
Granulocyte (GRA)	9.2 H	10 ³ /μl	2.0 – 8.0
lymphocyte (LYM) %	16.7 L	%	25.0 – 50.0
Monocyte (MON) %	6.1	%	2.0 – 10.0
Granulocyte (GRA) %	77.2	%	50.0 – 80.0
Red blood cell count (RBC)	5.15	10 ⁶ /μl	4.0 – 6.20
hemoglobin (HGB)	15.4	g/dl	11.0 – 17.0
Hematocrit (HCT)	47.6	%	35.0 – 55.0
Mean corpuscular volume (MCV)	92.4	μm ³	80.0 – 100.0
Mean corpuscular hemoglobin (MCH)	29.9	pg	26.0 – 34.0
Mean corpuscular hemoglobin concentration (MCHC)	32.4	g/dl	31.0 – 35.5
Red blood cell distribution width (RDWC)	12.3	%	10.0 – 16.0
Red blood cell distribution width (RDWS)	41.6	μm ³	37.0 – 46.0
Platelet count	287	10 ³ /μl	150 – 400

Cont... Table 1 represent the CBC of the patient before discharge

Mean Platelet Volume (MPV)	8.4	μm^3	7.0 – 11.0
Plateletcrit (PCT)	0.241	%	0.2 – 0.5
Platelet distribution width (PDW)	15.9	%	10.0 – 18.0
Platelet-large cell ratio (P-LCR)	16.2	%	12.0 – 42.0

Discussion

Novel coronavirus SARS-CoV-2 is a newly identified virus that can cause upper respiratory tract infection, pneumonia even death, started from Wuhan to China then to the world. The SARS-CoV-2 can be transmitted quickly through Respiratory droplets from coughing and sneezing as well as direct contact. People are generally susceptible to the virus however elderly and people with comorbidity and chronic illnesses are at risk for severe infection.

In this study, we reported a 67 years old smoking man who has SARS-CoV-2 confirmed by rRT-PCR. He has not experienced any signs and symptoms and remained healthy. Without and treatment he recovered from the virus. As the CBC showed the lymphocytes percentage was low at the time of discharge, similar situations have been seen in China. Lymphopenia happen in the elderly patients who are smoking and/or have hypertension ended up with pneumonia and death⁶. Lymphopenia consider danger sign as any study suggest having lymphopenia predict more severe form of infection, pneumonia or even death especially for elderly individuals⁷. However, in our case he did not even have mild symptoms nor pneumonia.

Several factors might be involved that our patient did not have any symptoms considering his old age, hypertension, smoking and lymphopenia. First of all, our patient did not have chronic illnesses except for hypertension. As Leung suggests that there is no exclusive evidence to support that hypertension can cause a more severe form of infection or an increased risk of mortality. In contrast diabetes might be associated with mortality⁸.

Secondly, physiology, host reaction and immunity play a major role in the severity of COVID-19 infection

and mortality rate. We notice the immunity of people in our region (Kurdistan/Iraq region) is high compared with other countries as the data by the ministry of health show a total of 496 confirmed cases with only 5 death and 403 recovery on May 25. According to ministry of health in Kurdistan Region none of the dead ones were due to corona virus infection or complication⁹. Another factor that may affect immunity is temperature and humidity, our region have higher temperature and lower humidity comparing to Europe countries. As higher temperatures decrease the incidence rate it might also affect the viral replication in a host as well as support better host reaction¹⁰. Another factor that might provide stronger immunity is dietary supplements such as vitamins C and D which proven to have a role in supporting the immune system¹¹.

Finally, recent studies suggest childhood vaccination plays a great role in that most infected children seemed to have a milder clinical course especially bacillus Calmette-Guérin (BCG)¹². BCG proved to produce cross-immunity not only against tuberculosis but also against viral infection¹³. The mechanism is unclear but BCG may boost the immune system against COVID-19. Our patient has received BCG as a standard immunization.

Conclusion

In conclusion, novel coronavirus SARS-CoV-2 is a very dangerous virus that affects health with a highly contagious rate. Elderlies and individuals that have chronic illnesses are at risk for severe forms of infection and even death. We notice quarantine and isolation are effective in the identification and prevention of the spread of SARS-CoV-2 in population. We suggest that early diagnosis of COVID-19 is a key to preventing transmission and death. Since there is not active

vaccine or treatment Immunity plays the greatest role in eliminating the infection. So boosting immunity is crucial as many studies suggest and BCG might be effective.

Acknowledgment

We wish to show our appreciation to Li Wenliang the first physician who died by coronavirus. We wish to extend our special thanks to the general director of health in Koya, department of health prevention and shahid dr.Khalid teaching hospital staff for their effort against coronavirus. We would like to thank the central laboratory in Erbil for carrying out the rRT-PCR tests. We finally thank Bahadeen Mahmud our patient.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Nil (permission granted to send for publication by the Shahid Dr.Khalid Teaching Hospital)

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Social Disparities and Incapability to Work Due to Illness or Disability among Working-Age Population in Thailand

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Abstract

This research aimed to determine the prevalence and investigate whether social economic factors were associated with incapability to work due to illness or disability among working-age population in Thailand. This cross-section study used the data from the National Labor Force Survey conducted by the National Statistical Office in 2015. The samples were Thai working aged people (aged 15 and 59 years old). The multilevel logistic regression analysis was performed to determine the relationships between socioeconomic factors and incapability to work due to illness or disability when controlling random variations among all provinces as well as other factors presented adjusted odds ratio and 95% confident intervals. 141,202 of respondents, 1.98% were incapability to work due to illness or disability. Factors associated with incapability to work due to illness or disability among them were male, single, household size of ≥ 4 persons and not head of the family, had low level of education and late adults. There were social disparities among those who incapability to work due to illness or disability. Systematically support for educations and job opportunities are needed organization necessary to paid on the prevention and

Keywords: *Disability, Incapability to work, Illness, Working age*

Introduction

Human resource especially working age group is one of the driving forces of economic growth and social development in the country as well as family dependency and taking care of their family¹. The country with more working age groups have higher potential for economic development. However, this strength could be hindered by incapability to work due to illness or disability. The International Classification of Functioning, Disability and Health defines disability as impairment status, limitation of physical activities and restriction of participation². In addition, the International Classification of Impairments, Disabilities and Handicaps of the World

Health Organization³ offers the definition of disability in the context of health experience as any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being. Therefore, people with disabilities are more likely to be unemployed and generally earn less even when employed⁴⁻⁹. In addition, childhood disability face many challenges in life such as discrimination, limitation to access the social service, family life, child's development and economic impact¹⁰.

In the aging labor force of industrialized countries, chronic diseases are becoming more prevalent as 37% of Dutch employees had a long-standing disease or handicap. While more than half of them stated they were not hampered in work performance, 41% were slightly hampered and 8% were severely hampered¹¹. The negative consequences of chronic illness cause of work limitation, work characteristics, and work adjustments.

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All of circumstances might be involved by health and sick leave¹². As same as diabetes¹³⁻¹⁵, cardiovascular disease^{14,16}, cancer^{14,17}, obesity¹⁴, back or neck pain^{14,18}, Systemic Lupus Erythematosus (SLE)¹⁹, mental health problems and chronic pain²⁰ were considered as prolong illness among them. Moreover, work disability in patients with SLE was associated in particular higher disease activity, presence of renal involvement and organ damage¹⁹. Previous studies reported factors associated with absence to work or disability were working hours, working place away from home, no autonomy in planning task as well as fatigue during working was one of the risk of sickness that lead to absence from work or work disability²¹.

Base on the National Statistic Survey, Thailand had 1.5 million or 2.2% people with disability. Approximately there were 29.84% of the persons not in labor force who absence from work due to illness or disability¹. Generally, disability persons get good support in welfare from the government. However, monthly income from work was still limited in relation with their demands²². Even though they are importance for economic development, at present there are no comprehensive study on incapability to work due to illness or disability at the national level.

Objective

To determine prevalence and investigate factors associated with incapability to work due to illness or disability among working-age population in Thailand.

Method

Study design

This cross-sectional study used the data from The Labor Force Survey (LFS) of the National Statistical Office. This survey was conducted during the 1st -12th of July-September 2015. The multistage stratified random sampling was adopted for the survey. Provinces were constituted as strata-77 strata. The samples were head or member of 4,800 households in the Bangkok, 48,960 households in other municipal areas and 34,920 households in non-municipal areas, made up the total of 83,880 households throughout the kingdom that response to a structured questionnaire interview. The inclusion criteria to recruit the samples to this study were being a working age group (15-59 years old). There were total

of 141,202 Thai working-age people were included to analyze.

Study outcome

The outcome variable was incapability to work due to illness or disability (yes/no). It was considered if people had not available for work because of physical or mental disability or chronic illness.

Data analysis

The independent variables were analyzed using descriptive statistics presenting percentage and mean, standard deviation, minimum and maximum. The magnitude and distribution of incapability to work due to illness or disability was analyzed presenting percentage and 95% confidence interval. The bivariate analysis was used to identify the association between each independent variable and the incapability to work due to illness or disability. The factors that bivariate analysis had p-value < 0.25 were taken into the multivariable analysis. According to the hierarchal structure of the LFS data, the multilevel logistic regression analysis was performed to determine the association of independent factors with incapability to work due to illness or disability when controlling random variations of all provinces in the country, presented adjusted odds ratio and 95% confident intervals.

Result

Among a total of 141,202 working age, 52.59% were female with the average age 38.69 years old. The highest proportion of the respondents had non to primary education, followed by secondary and post-secondary education. Most of them were married, more than half had 4 and more family members. Only one third of them were a head of family.

The prevalence of incapability to work due to illness or disability were 1.98% (95%CI 1.91- 2.05). The distribution of individuals who were incapability to work due to illness or disability were varied among regions. The highest prevalence was found in the North 2.47% (95%CI 2.30-2.65), followed by 2.27% (95%CI 2.12-2.43) in the Northeast, 1.78% (95%CI 1.65-1.90) in the Central & East and 1.54% (95%CI 1.39-1.70) in the South. The lowest proportion was found in Bangkok 1.18% (95%CI 0.93-1.43) (Fig.1).

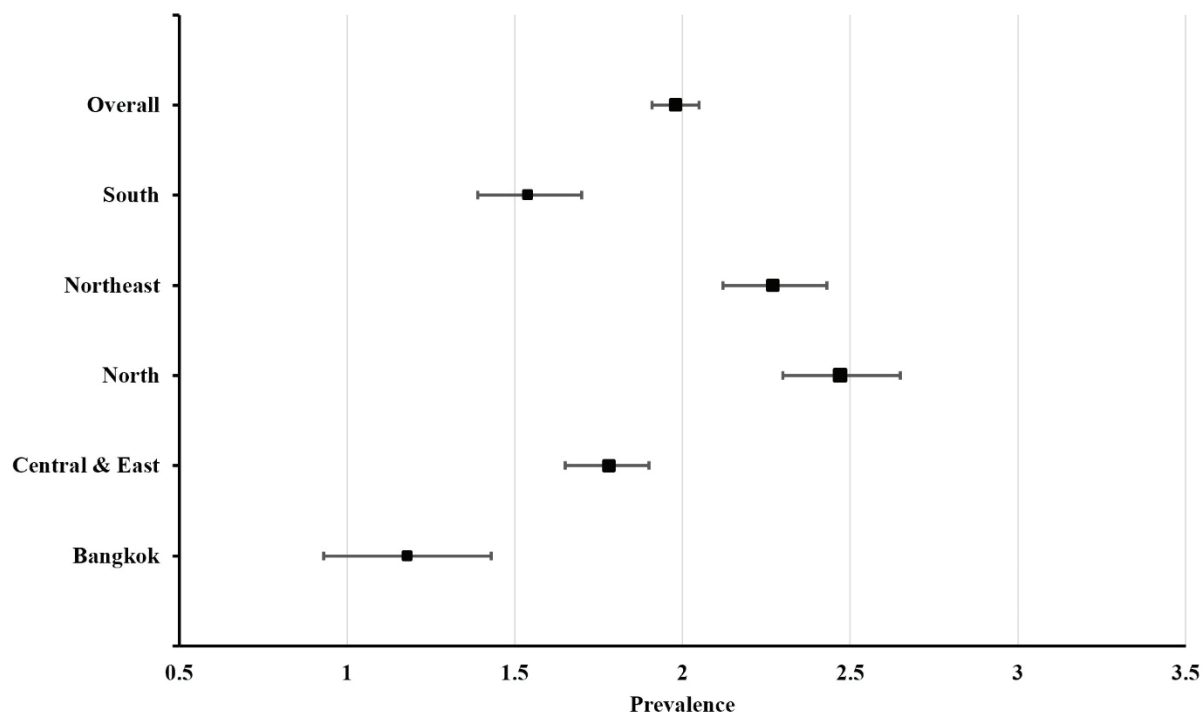


Figure1: Prevalence of incapability to work due to illness or disability among working-age people in Thailand in 2015

The multilevel logistic regression model indicated six factors that were significantly associated with incapability to work due to illness or disability among working-age people in Thailand. These factors were; had low level of education, single, late adults, not the head of his/her family, males, and family size of 4 people and more when controlling the effect of provinces. (Table 1).

Table 1: The multivariable analysis of factors associated with incapability to work due to illness or disability among working-age people in Thailand in 2015 using the multilevel logistic regression model presenting odds ratios, adjusted odds ratios, 95%CI and P-value.

Factors	Number	% incapable to work	OR	adj.OR	95%CI	P-value
Education level						<0.001
Bachelor’s degree & higher	18,414	0.37	1			
Secondary & post-secondary school	59,765	0.97	2.63	3.65	2.82-4.71	
Primary school & no formal education	63,023	3.41	9.53	13.92	10.86-17.86	
Marital Status						<0.001
Married	93,099	1.01	1			
Single	37,533	3.94	4.04	12.28	11.11-13.58	
Widowed/Divorced/other	10,570	3.60	3.67	4.15	3.66-4.70	
Age group (years old)						<0.001
15-24	25,835	1.28	1			
25- 34	26,459	1.47	1.15	3.35	2.87-3.90	
35-44	34,148	1.81	1.42	4.81	4.16-5.79	
45-59	54,760	2.66	2.11	8.08	6.98-9.34	
Head of household						<0.001

Cont... Table 1: The multivariable analysis of factors associated with incapability to work due to illness or disability among working-age people in Thailand in 2015 using the multilevel logistic regression model presenting odds ratios, adjusted odds ratios, 95%CI and P-value.

Factors	Number	% incapable to work	OR	adj.OR	95%CI	P-value
Yes	47,548	1.42	1			
No	93,654	2.26	1.61	1.90	1.71 - 2.12	
Gender						<0.001
Female	74,260	1.55	1			
Male	66,942	2.46	1.60	1.54	1.41-1.68	
Number of household member (persons)						0.0047
1	7,560	2.00	1			
2-3	57,535	2.09	1.05	1.37	1.13-1.67	
≥4	76,107	1.89	0.95	1.37	1.12-1.67	
Region						0.4400
Bangkok	7,051	1.18	1	-		
North	29,228	2.47	2.12	-	1.69-2.67	
Northeast	36,667	2.27	1.95	-	1.55-2.45	
Central & East	43,384	1.78	1.51	-	1.20-1.90	
South	24,872	1.54	1.31	-	1.03-1.67	

Discussions

This study illustrated that almost 2% of working-age population in Thailand were incapability to work due to illness or disability. The proportion in the North and Northeast were higher than the national average of 1.98, whereas they were lower in the Central & East, the South and Bangkok. It might be there were more working age population from the North and Northeast migrated to work in Bangkok and Central & East as well as the South. Therefore, when they had illness or disability that mad them incapability to work, they moved back home²³. This work-related illness has effect on the economy. The average income per capita of Thai per year was about ฿240,000. However, the income loss from incapability to work is about ฿22 billion/ month family^{1, 24}

The result indicated that low educational attainment was strongly associated with incapability to work due to illness or disability. This finding was similar to study from National Health Interview Survey–Disability Supplement, USA which found that low education was one of the barriers to reach the market labor needed²⁵. This could be said that in case of congenital disability interrupt the chance to study, therefore low education

make them lose opportunity to find the job with high salary needed^{25,26}. Being single was more incapability to work due to illness or disability by comparing with having partner. This finding is in line with a study showed the marital status influent on working disability benefits²⁷. It might be explained that staying alone, if any accident occurs the length of absence from work or incapability to work take longer time than those who has someone taking care. Among working age group, late adult with older age had influence on incapability to work due to illness or disability. Our finding was similar with the result from a cohort study in conducted in Sweden²⁸ which showed that those with older age, low income, with previous sick leave, no employment and non-Swedish origin had higher risk of disability pension, while those younger groups had lower risk. Moreover, this study indicated the relationship between male gender on incapability to work due to illness or disability. This could be based on the fact male tends to take more dangerous task. In some case, they have gotten work-related injury but still continuing their job but unable to work as same as before^{27, 29}. Living in a big family and not being a head of the family were also associated with the incapability to work due to illness or disability. The possible reason among those with congenital disability, they cannot be head of the

family and they need help from others therefore lived in a big family is necessary²⁵. Especially in the context of Thailand, disability people who needs special care must live in the big family, therefore they can get assistants and care from their family members as well as from community and other relevant organizations³⁰⁻³².

Conclusion

Almost 2% of working age population in Thailand were incapability to work due to illness or disability. Social disparities were main factors influencing incapability to work due to illness or disability. The vulnerable group were male, low education, single, late adults, being family member and lived in a big family. There were in need for systematically support for educations and job opportunities. Occupational health and safety should be strengthening among working age groups. Education and job opportunity among genital abnormally should be systematically improved. Chronic degenerative disease such as diabetes and hypertension which will follow which complication which will put them to incapability to work due to illness or disability should be properly preventing and management.

Acknowledgement: We would like to express our sincere appreciation for the National Statistical Office and the participants for the data, as well as the Research and Training Center for Enhancing Quality of Life for Working Age People, Khon Kaen University, Khon Kaen, Thailand for the support.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE592203, given on 24 June 2016.

Source of Funding- Research and Training Center for Enhancing Quality of Life for Working Age People, Khon Kaen University, Thailand.

Conflict of Interest - Without

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Building a Cognitive Test For Offensive and Defensive Formations in Volleyball and Codifying it for the Fourth Stage Students, College of Physical Education and Sports Science, Diyala University

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Abstract

The importance of the research was evident because the volleyball player does not depend on mastery and mastery of only one skill, but full knowledge of all skills and their knowledge in terms of movement to different playing centers and their work requires him to have special mobility capabilities that qualify him to perform such a role, and here the guidance of the coach plays an important role. The exchange of information between the athlete and the coach (the teacher and the learner), as well as receiving information before the motor performance, “and during it provides an opportunity to fine-tune and organize the behavior commensurate with the situation facing or required despite knowledge of the performance requirements. This in itself is a good measure by which the trainer can know the athlete’s ability to analyze. Correct and solving the kinetic duty intellectually and applying it in practice, that is, standing on a level.

Keywords: *cognitive test, offensive, defensive, volleyball, codifying.*

Introduction

High levels of sport and achieving victory will not be an easy process to achieve because the level of sports in most activities has reached high levels in terms of (technique, tactics). And because the steps for the success of any sporting activity in any society must follow the appropriate and correct method, which mainly aims to advance the game of volleyball and the actual extension of the practice of this activity becomes a link to the highest levels, there is no doubt that their goal is one in developing and advancing it, and all of this is done Through the amount of knowledge information that acquires and applies its quality for long periods and indicates ⁽¹⁾ that scientific knowledge is the outcome of information that represents an understanding of the game’s philosophy in the field of teaching, arbitration, training and everything related to the numbers of an

angel capable of performing his duties well within the field Volleyball game as it formed Scientific knowledge in the teaching field is an important station for determining the level of perception for students, as it relates to the ability to create a state of interdependence between understanding and cognitive perception and the ability to apply this through performance, and in the field of training this interconnection appears stronger to achieve high-level achievement. Scientific knowledge takes special significance in colleges of physical education as it is the cornerstone of the level of students’ understanding and their understanding of theoretical vocabulary and the practical applications that they absorbed, and because the level setting for measuring students’ ability in the field of scientific knowledge is still based on the teaching experience and his observation in setting scientific degrees for students, as this measure It is subject to the teaching self-observation more than it is subject to codified standards, and all educational systems are unanimously agreed that the teacher is one of the basic elements of the educational process, without an academically qualified teacher and professionally

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trained who understands his large and comprehensive role, cannot reaching to achieve the desired goals in the delivery of different knowledge to the new generation. The main source that the researchers obtained for the problem is the lack of a cognitive test in offensive and defensive moves in volleyball for fourth-stage students, as the difficulty of the position and the movements in the attack and defense depend on the amount of knowledge prior to the student in order to be in an accurate position and an optimal accurate response because mastering the defensive formations It depends on the organized harmony and coordination between the players in the arena and is the basis of the coordinated collective attack in volleyball, and this depends on what he indicated ⁽²⁾ “that the athlete uses his intellect and intelligence to implement tactical plans and try to discover a brother Technically loyal “.

Research methodology and field procedures:

Research Methodology:

The researchers used the descriptive method with

Table (1) shows the total number of people, the survey sample and the sample.

Applied sample	Construction sample	Survey Sample	Total number	Class
15	17	5	37	a
14	18	5	37	B
14	19	5	38	C
16	20	5	41	e
19	20	5	44	F
78	84	25	197	Total

Means, devices and tools used in the research:

Means of collecting information:

Scientific sources (Arabic and foreign).

International Information Network (Internet)

- Tests and measurements.

survey method and correlations

Society and research sample:

The researchers chose the research community in a survey method, which represented the fourth stage students in the College of Physical Education and Sports Science - Diyala University for the academic year (2018-2019), and the number (197) students only, whose names are included in the official lists of the Registration Division, and the research samples were chosen. Unorganizedly randomly (lots) and divided into.

- The polled sample, whose number was (25), with a percentage of 12.69%.

The actual application sample, whose number was (78), with a percentage of (39.59%).

- A sample was excluded and their number was (84), with a percentage of (42.63%).

As shown in the details in Table 1.

- Test results registration forms.

Building the cognitive test:

Determining the dimensions of the cognitive test:

The researchers determined the dimensions of the cognitive test based on the fourth-level volleyball course (College of Physical Education and Sports Science),

which are offensive and defensive formations of volleyball, according to the sectorial curriculum of the Ministry of Higher Education and Scientific Research.

Formulation of test items:

Q1) When a team plays with an offensive plan (5-1), the team consists of:

- a. Three stomachs and three attackers.
- B. Two minerals and four attackers.
- C. One stomach and five attackers.

Q3) When the team plays with the offensive plan (6-0), each player reaches:

- a. Center 4 is the stomach.
- B. Center 3 is the stomach.
- C. Center 2 is the stomach.

Q5) In Plan (5-1), when the equipment prepares the ball for the hitters, it retreats to the defense to:

- a. Center (6).
- B. Center (5).
- C. Center (1).

Q 7) In the offensive plan (5-1), when the stomach is at the center (6), it is:

- a. He moves to prepare the ball to occupy the position (3).
- B. Moves to prepare the ball to occupy the center (4).
- C. Moves to prepare the ball to occupy the position (2).

Q 9) In the offensive plan (5-1), when the equipment moves from the rear centers to prepare the ball, it retracts to defend:

- a. Center (6).
- B. Center (5)
- C. Center (1).

Q11) Plan (4-2) is one of the most used plans for a

category:

- a. Applicants.
- B. Youngsters.
- C. Cubs.

Q13) When the team is in transmission mode in Plan (5-1) it is preferred to:

- a. The stomach is in the center (6).
- B. The stomach is in the center (1).
- C. The stomach is in the center (2).

Q15) In the offensive plan (4-2), when the equipment is at the center (4) at the reception, it is preferred that:

- a. Moves to occupy the position (3).
- B. Moves to occupy the center (2).
- C. It never moves and stays in the same position.

Q17) The defensive plan (6) advanced means:

- a. Back-row players should be on the same footing.
- B. The back row players should be diagonally.
- C. The back row players must be in the number (8).

Q19) When the opponent performs an overwhelming beating from center (4) and without a blocking wall, the appropriate defensive formation is:

- a. Defensive formation (1-3-2).

Q2) When a team plays with an offensive plan (4-2), the team consists of:

- a. Four stomachs and two attackers.
- B. Minerals and four attackers.
- C. Three stomachs and three attackers.

Q4) In the offensive plan (5-1), when the equipment is in the center (1) and during the reception, then:

- a. It moves from its center to the center (3).
- B. It moves from its center to the center (4).
- C. It moves from its center to the center (2).

Q6) Advance teams often play with an offensive plan:

- a. (4-2).
- B. (5-1)
- C. (6- Zero).

Q8) In the offensive plan (5-1), when the stomach is at the center (5), it is:

- a. He moves to prepare the ball and occupies the center (2).
- B. He moves to prepare the ball and occupies the center (3).
- C. Moves to prepare the ball and occupies the center (4).

Q10) When the team plays with the plan (4-2), the two preparers are:

- a. They are always distributed in parallel.
- B. They are always distributed in reverse.
- C. Always distributed randomly.

Q12) When the team is in the reception position in the plan (5-1) it is preferred to:

- a. The stomach is in the center (1).
- B. The stomach is in the center (2).

C. The stomach is in the center (3).

Q14) The offensive plan that contains the largest number of strikers is:

- a. Offensive plan (6- Zero).
- B. Offensive plan (4-2).
- C. Offensive plan (5-1).

Q16) The most effective defensive plan against the opposing team's attacks is:

- a. Defensive Plan (6) advanced.
- B. Defensive plan (6) overdue.
- C. Two-bracketed defensive plan.

Q18) The defensive plan (6) overdue means:

- a. The back row players are V-shaped.
- B. Back row players have to be straight.
- C. The back-row players should be arc-shaped.

Q20) When the overwhelming beating is not so light and easy that the ball can be expected to fall, we:

- a. We use a wide defensive formation.
- B. We use a narrow defensive formation.
- C. We use random defense formation.

Preparation of specifications table:

Table (2) shows the semesters, the number of hours, the percentage, cognitive goals and the number of questions for each semester

Rounding	The number of questions for each chapter	Implementation 30%	Understanding 30%	Remember 40%	percen-tage	The number of hours	Chapters
4	3.6	1	1	2	0.066	2	6-0
8	7.8	2	2	4	0.133	4	4-2-2
8	7.8	2	2	4	0.133	4	4-2-3
12	12	3	4	5	0.20	6	5-1

Cont... Table (2) shows the semesters, the number of hours, the percentage, cognitive goals and the number of questions for each semester

4	3.6	1	1	2	0.066	2	6- Late
4	3.6	1	1	2	0.066	2	6- Advanced
8	7.8	2	2	4	0.133	4	Loose player
12	12	3	4	5	0.20	6	Attacking player cover
60		15	17	28	100	30	Total

The test experiment:

a. Exploratory experience:

The researchers conducted the exploratory experiment without the main research sample on (11/12/2018) to verify the clarity of the test instructions in terms of formulating questions, answering their paragraphs, and determining the time required to answer, the efficiency of the auxiliary work team, and the difficulties and obstacles that the researcher may encounter when Take the test, and the test was applied to a survey sample of (25) students from the fourth grade / College of Physical Education and Sports Science / University of Diyala, and the results were positive in terms of rushing towards the test, and this only indicates the sincerity of the answer, and not falsify it from the sample .

B. The main experiment of cognitive test:

After the test, with its instructions and questions, became ready for application, the researchers began with the auxiliary work team applying the test to the research sample (the construction sample) and their number (84) students for the period from 18-20 / 12/2018), and after completion the data has been scheduled for individuals The construction sample, as a prelude to statistical analysis.

Main experience:

After the results of the experimental experiments confirmed the safety and correctness of the implemented procedures and included the conditions and scientific

specifications for the tests as well as the relevance of the research sample, the cognitive test was applied in its main final form and it consisted of (78) rationing sample students from all people and were randomly chosen for the accuracy of the study description on (4/22/2019).

The researchers used the statistical realities (SPSS)

1. Factors of ease and difficulty
2. Coefficient of discrimination
3. Arithmetic mean
4. Standard deviation
5. Standard grade g and rate c

View, analyze and discuss the results

View and analyze the results of raw scores, repetitions, and percentages achieved for scout skills tests and discuss them. ⁽³⁾

Good tests are those that include criteria that give the raw values that are extracted through the application of the tests a meaning and meaning, as the criteria help the laboratory to identify its relative position in its group, and this is an important and necessary measure to achieve the conditions of evaluation. ⁽⁴⁾

Statistical description Show the cognitive test of defensive and offensive formations, analyze and discuss them:

Table (3): The statistical description shows the cognitive test of defensive formations Attacking volleyball.

78	Valid	N
0	Missing	
45.321	Mean	
0.456	Std. Error of Mean	
4.027	Std. Deviation	
0.587	Skewness	
0.272	Std. Error of Skewness	

From Table (3), descriptive statistics show the cognitive test of defensive and offensive formations, and there are very important indications that we can infer the moderation of the research sample on the standard error (Kaos), which is that all the values of the arithmetic circles were greater than the values of standard deviations, as well as the value of the standard error, which constitutes the second indication of the equinox, and finally the torsional coefficient values, which ranged from (± 1). After that, the researchers extracted the codification steps on a sample of (78) students in the fourth stage by converting the raw grades into real grades, which is the adjusted T value.

Display and analyze the standard levels, the results of the raw scores and their repetitions, and the percentages achieved for the cognitive test of defensive and offensive formations in volleyball:

Natural distribution is an objective method for estimating grades, especially if the group on which measurements are made is large, in addition to that it is one of the most common distributions in the field of physical education because many of the characteristics and characteristics that are measured in this field are approximated in the natural curve.

Table (4) shows the raw scores and levels for the cognitive test of defensive and offensive formations in volleyball

T	Cumulative Percent	Valid Percent	Percent	Frequency	Date	
36.79	11.5	11.5	11.5	9	40.00	Cognitive scale
39.27	23.1	11.5	11.5	9	41.00	
41.75	34.6	11.5	11.5	9	42.00	
46.72	42.3	7.7	7.7	6	44.00	
49.2	53.8	11.5	11.5	9	45.00	
51.69	57.7	3.8	3.8	3	46.00	
54.17	73.1	15.4	15.4	12	47.00	
56.65	84.6	11.5	11.5	9	48.00	
59.14	88.5	3.8	3.8	3	49.00	
61.62	89.7	1.3	1.3	1	50.00	
66.59	94.9	5.1	5.1	4	52.00	
74.04	100.0	5.1	5.1	4	55.00	
		100.0	100.0	78	Total	
45.321	Arithmetic mean					
4.027	standard deviation					

Table (4) the reality of the sample level in the cognitive test of defensive and offensive formations despite its importance if its percentage (46.153%) was above the level of acceptance of the total of the research sample and (53.846%) under the level of acceptance meaning meaning as well as the highest frequency was at the level of Admission is (15.384%), and this is the case of the fourth stage students in the College of Physical Education and Sports Science, Diyala University in offensive and defensive formations, and this is in line with what it indicated ⁽⁵⁾ as scientific knowledge is an important variable in learning the motor skills that It requires understanding and perception when performing and learning it, “and through Mullah The general moment, we see that a student or player with good physical ability with a specific field intelligence is better in responding to performance and the method of using effort than another student who possesses the same specifications with a weak level of intelligence. ⁽⁶⁾

Conclusion

The cognitive test proved its validity in measuring the cognitive aspects of defensive and offensive formations of volleyball by distributing it moderately to the building sample and its ability to distinguish between the completion of the sample members with a high and low level in addition to achieving high honesty, consistency and objective transactions. Positive and more positive levels and that the research sample was more than (46.153%) above the admission line; therefore the researchers recommend adopting the cognitive test in the continuous evaluation process for students, as well as adopting the criteria that the research reached during the evaluation process The selection, continuous updating (modification) of standards according to scientific

knowledge and over the years, and the cognitive test extracted can be codified on other age groups (male - female) and the development of standards.

Conflict of Interest: student of College of physical education and sport science, University of Diyala, Iraq.

Source of Funding: Self-funding

Ethical Clearance- Taken from: College of physical education and sport science, University of Diyala committee.

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Pain Sensitivity of Sub-Occipital Muscles in Temporomandibular Disorder Patients: A Comparison with Normal Subjects

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Background: Temporomandibular disorders (TMDs) are one of the most communal musculoskeletal disorders. Sub-occipital muscle tenderness shows a significant role in the pathogenesis of TMD. The main purpose of this study was to find out the Pressure Pain Threshold (PPT) level in patient with TMD.

Material and Method: A total of two hundred participants were divided into group A with 100 participants presenting with signs and symptoms of TMD and group B with 100 participants of normal individuals. Age of the participant was between 18-49 years. Sub-occipital muscle sensitivity was measured by Pressure pain threshold algometer.

Results: The mean value of PPT for group A found very low, for male=3.77±0.16 (Right side), 4.52±0.26 (left side) and for female=3.77±0.16 (right side), 4.52±0.26 (left side). whereas mean value of group B for male 4.94±.46 (Right side), 4.94±.46 (left side) and for female 4.94±.46 (right side), 4.94±.46 (left side). These results were statistically significant ($\square < 0.05$).

Conclusion: Participants with TMD showed low PPT as compare to normal control subjects. Therefore, it is important for the clinician to give importance to the sub-occipital muscles for better management of TMD patients.

Keywords: Temporomandibular Disorders, Pressure Pain Threshold, Sub-Occipital Muscles

Introduction

The pain which arise from temporomandibur joint, disk, masticatory muscles and related structures is known as Temporomandibular Disorder (TMD). This term is used to refer to a group of symptoms which involves the neuromuskuloskeletal structures around the Temporomandibular joint, [1] and the cost effects is very high. [2]

The common clinical features exhibit as pain at orofacial area and ear, clicking and popping sounds, and limited jaw movements. [3-5] Due to CNS involvement, TMD patients show increased pain sensitivity and psychosomatic dysfunction. [5,6] Study proved that in 70% of TMD patient shows neck pain. [7, 8] Neuroanatomical and functional networks between masticatory and cervical areas are debated as enlightenments for

associated mandible and neck symptoms. [9, 10]

There is a relation between stomatognathic system and upper cervical spine with TMD dysfunction. If further relationship is established, new clinical strategies that target both regions should be considered and therefore, the need of a multidisciplinary approach should be reinforced in the management of TMD patients. But, there are very few studies which show there is effect of TMJ dysfunction on sub-occipital muscles and vice versa. This study aims to see if there is any cause and effect relationship between sub-occipital muscles and TM joint pathology.

Materials and Method

This study is an observational cross-sectional study and carried out during May 2018 to March 2019,

Department of Physiotherapy, Lovely Professional University, Punjab. Pain sensitivity was assessed by digital pressure Algometer, FDX (Wagner, Greenwich, USA).

Total 200 participants aged between 18 and 49 years were selected for the study. The subjects were divided into two groups. Group A is comprised of 100 participants with TMD and group B is included of 100 asymptomatic participants without any signs and symptoms of TMD. Institutional research and institutional ethical committee approval were obtained before recruiting the patient (LPU/IEC/2019/01/05) for the proposed study. Written, signed informed consent was obtained from all participants. The participants were included for group A, pain and positive three finger test with limited MMO of less than 30mm (but not necessarily painful) clearly originating in the TMJ. For group B subjects without any signs and symptoms of TMD with these who are not

suffering from systemic conditions which may affect the functioning of TMJ, for example, rheumatoid arthritis, scleroderma, and septic arthritis.

The participants were excluded from the study for group A, those who are having history of hypertension, diabetes, asthma, epilepsy, and trauma to the maxillofacial area, any previous history of surgery to the maxillofacial area and malignancy.

Results and Analysis

Statistical analysis was carried out using SPSS 16 and paired t-test was used to compare the TMD and normal healthy population which are known to control group. Demographic variables (age, weight, height, BMI) are showing in the (Table-1). Statistical analysis (Table-2) revealed low PPT score among TMD patients.

Table 1: Demographic data of the subjects (Mean±SD)

Variables	TMD	Control Group
	Mean ± SD	Mean ± SD
Age(y)	39±10.11	38±12.12
Weight(kg)	66.22±5.93	67.32±7.58
Height(cm)	163.34±8.52	164.33±7.24
Gender	Female (n=68) Male (n=32)	Female(n=60) Male (n=40)
Body mass Index(kg/m ²)	22.55±3.65	23.32±3.15

Table 2: PPT in subjects with TMD and without TMD (males and females).

Group	Male		Female	
	Right	Left	Right	Left
Group-A	3.77±0.16	4.52±0.26	3.77±0.16	4.52±0.26
Group-B	4.94±.46	4.94±.46	4.94±.46	4.94±.46
	<i>P</i> < 0.001	<i>P</i> < 0.001	<i>P</i> < 0.001	<i>P</i> < 0.001

Discussion

The main objective of this study was to investigate the sub-occipital musculature sensitivity in patients with TMD. Numerous studies scrutinised that the presence of signs and symptoms in the cervical area of TMD's patients is quite common, which is in line with the outcomes of this study.^[11-16]

Pain is a difficult phenomenon predisposed by both biologic and psychological reasons.^[17] Several studies suggested that neck muscle tenderness in which palpation technique was used.^[18, 19] It seems there is a relationship exist between mandible and Upper Cervical vertebra i.e. C1 and C2. During mastication of food, there are movement happening in the superior Cervical Spine in coordination with mouth depression and elevation as revealed by previous studies and that is again due to coordination of cervical muscles and muscles of mastication. Thus, the fixation or change in head position may cause alteration in movement of lower jaw.^[18]

Biomechanical study proved that depression of mouth is directly associated with upper cervical spine extension.^[16] Patients with TMD have revealed noteworthy restrictions in movement of superior cervical spine in compared to normal individuals.^[15] Hence TMJ dysfunction can cause Neck dysfunction and vice versa.

Many study proved that sign and symptoms are present in cervical area those who are suffering with TMD and they have been showing that the presence of tenderness in the cervical musculature also which is in line with the findings of this study.^[20-23] The outcomes of these studies recommend that a more integrated treatment approach including sub-occipital muscle assessment is important when handling patients with TMD.

Conclusion

The result of this study shown that there is a higher rate of sub-occipital musculature tenderness in subjects with temporomandibular disorders. Therefore, for the better management of TMD clinician should consider these factors, otherwise treatment may become unproductive and may give rise to treatment failure.

Source of Funding - Self funding

Conflict of Interest: Author does not have any conflict of interest

Ethical Clearance: Institutional research and institutional ethical committee approval were obtained before recruiting the patient (LPU/IEC/2019/01/05) for the proposed study.

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Association between the Use of Pessary and the Length Use of Pessary with the Incident of Bacterial Vaginosis on Pelvic Organ Prolapse Patients

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Abstract

Introduction and Hypothesis: Pelvic Organ Prolapse (POP) is a condition with specific signs such as descent of the fornix anterior, fornix posterior, uterine, cervix, apex of the vagina after hysterectomy or perineal. The use of pessary is a conservative and the first line of POP medication. Most women who used pessaries complained about vaginal discharge, more than 50% of them were proven suffered from bacterial vaginosis. This research was aimed to know whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries among POP patients. We hypothesized that the use of pessaries and the length use of pessaries had a significant association with the incident of BV. This study was a case-control study. There were 68 medical records, which were obtained through purposive sampling. Independent variables were the use of pessaries and the length use of pessaries, the dependent variable was the incident of BV among POP patients. Data collection sheets were the instrument of this research. Chi-Square, Fisher Exact Test and Odd ratio were used to analyze the data. This research used α : 5%, CI: 95% Result: This research revealed that there was a significant association between the incident of BV on POP patients with the using of pessaries ($P=0.001$) and the length use of pessaries ($P=0.024$). Odd ratio 5.9 (95% CI, 1.95-17.97) means patients with POP who used pessaries had a probability to suffer BV 5.9 times higher than those who didn't. Conclusion: there was a significant association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients.

Keywords: bacterial vaginosis, pelvic organ prolapse, pessary, the length used, the usage

Introduction

Pelvic Organ Prolapse (POP) is a kind of disruption of the pelvic organ such as vagina, rectum, uterine and bladder, they are going down into the hiatus genital.¹ Medium and higher stages of POP induce many complaints, those complaints are a bulge of the vagina, difficulty of voiding and constipation, sexual dysfunction,

declining quality of life such as mood swings, disturbing of resting needs and social activity.² A pessary is the first line of POP medication, 89% gynecologists and 98 % urogynecologists used pessaries to relieve patients' complaints which were related to POP.³ Women with POP who followed one-year medication of both conservative and operative, they declared that they had improvement of voiding, defecating, sexual function and quality of life.³ A pessary is a modest, effective and efficient device, at the other side, patients who used pessaries for a long time, they had to deal with the probability of suffering bacterial vaginosis (BV), the user of pessary had 4.37 times higher to suffer BV than women with POP who didn't use it.⁴ Therefore there was a controversial statement in a study which had done by Yoshimura et al in 2016. They used the conventional

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method and clone library method. The conventional method revealed that the using of pessaries lead the users to suffer BV and the clone library method stated that pessary didn't always disturb normal vagina flora, especially in those who had lactobacillus spp. before pessaries wearing.³

BV is an abnormal discharge from the vagina. Most of the women at reproductive ages complains about BV. Half of them didn't realize the signs of BV, the risk factor of Sexual Transmitted Disease (STD) include Human Immunodeficiency Virus (HIV), endometritis post-abortion, and it has side effect for pregnancy such as miscarriage and preterm labor.⁴

Women with POP who used pessaries have to deal with the probability of suffering BV which could induce STD, HIV, abortion and preterm labor.^{4,5}

The researcher had done a preliminary study in Gynecology Outpatient of Doctor Soetomo General Hospital Surabaya, the preliminary study revealed that POP and BV were belong to top ten diseases which were brought the patients to follow medication.

Based on the background above, researchers wanted to find whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients in Doctor Soetomo General Hospital Surabaya.

Methods and Material

This research was an observational analytical case control study. The independent variables were the use of pessaries and the length use of pessaries on POP patients, while the dependent variable was the incident of BV among POP patients. The population was POP patients' medical records in Gynecology outpatient Doctor Soetomo General Hospital Surabaya in the period of January 2017 till December 2018. The number

of population were 117 outpatient medical records' POP patients. This study applied a proportion of case and control, it was 1:1. The case in this research was POP patients who used pessaries, and the control of this research was POP patients who didn't use any pessaries. From those medical records, samples were taken by purposive sampling. The amount of the samples were 68 medical records, 34 medical records of POP patients who used pessaries at least 2 weeks and 34 medical records of POP patients who didn't use any pessaries. The patients' records were carefully reviewed. Data collection included age, parity, whether each of them used pessaries or not, mode of delivery, vaginal swab results.

Nugent score was used to determine whether patients suffered from BV or not.⁶ Nugent score 0-6 was interpreted as negative for BV, and Nugent score 7-10 was interpreted as positive for BV.⁶

This research used univariate and bivariate analysis. A univariate analysis was used to analyze the frequency distribution of each variables' characteristics. Data of this category will be presented with the size of the presentation or proportion. A bivariate analysis was used to count the proportion of POP patients who used pessaries and POP patients who didn't use any pessaries to determine whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients. Chi-Square and Fisher Exact Test were bivariate analysis which researchers used to analyze the data, we used α : 5%, CI: 95%. Contingent Coefficiency was used to determine the closeness of the association between independent and dependent variables. The researcher used Statistical Package for The Social Science (SPSS) to analyze data, this study used $p < 0,05$ to state whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients.

Findings

Table 1 Characteristics Patients of Pelvic Organ Prolapse in Gynecology Outpatient of Doctor Soetomo General Hospital Surabaya Year 2017-2018

	Pessaries (%)	Without Pessaries (%)	P value
Age			
<50	0 (0)	5 (7.35)	0.053
≥ 50	34 (50)	29 (42.65)	
Parity			
< 4	8 (11.76)	15 (22.06)	0.073
≥ 4	26 (38.24)	19 (27.94)	
Mode of Delivery			
Vaginal Delivery	34 (50)	34 (50)	-
Sectio Caesaria	0 (0)	0 (0)	

Table 1 describes most of the patients who suffered from POP attain the age of 50 or older. Most of them had parity 4 or higher and all of them had undergone vaginal delivery. There was no association between age and parity with POP patients tendency to choose medication with or without any pessaries. It was concluded by p-value, which p-value for both of them was higher than 0,05 ($p > 0.05$).

Table 2 Proportion of Incident Bacterial Vaginosis on POP Patients with Pessaries and without Pessaries in Doctor Soetomo General Hospital Surabaya Year 2017-2018

POP	Positive BV (%)	Negative BV (%)	Total (%)
Pessaries	19 (55.8)	15 (44.12)	34 (100)
Without Pessaries	6 (17.65)	28 (82.35)	34 (100)
Total	25	43	68

Table 2 describes the proportion of incident BV on POP patients with pessaries were almost 3 times higher (55.8%) than those ones who didn't use any pessary (17.65%).

Table 3 The Results of Cross Tab Analytic For The Use of Pessaries in POP Patients And The Incident Of Bacterial Vaginosis

Test's Name	Results
Chi Square	0.001
Contingen Coeficiency	0.369
Odd ratio	5.9

Table 3 describes the results of chi-square, contingent, and odd ratio. Chi-Square test gave $p = 0.001$, it means that there was an association between the incident of bacterial vaginosis and the use of pessaries on the POP patient. Contingent Coefficiency resulted from 0.369, it means the closeness association

between the incident of bacterial vaginosis and the use of pessaries on the POP patient was low. The odd ratio was 5.9, means POP patients who used pessaries had a probability 5.9 higher to suffer bacterial vaginosis than those who didn't use any pessary.

Table 4 Period of Pessaries Setting Up and the onset of Incident Bacterial Vaginosis in RSUD. Dr. Soetomo Surabaya Year 2017-2018

Period of Pessaries Setting Up	The Amount of POP patients with pessaries who suffered from bacterial vaginosis (n= 19) (%)
2 weeks- < 6 month	6 (31.7)
6 month - < 1 year	7 (36.8)
1 - < 2 year	2 (10.6)
2 - < 3 year	1 (5)
≥ 3 year	3 (15.9)

Table 4 describes most of the POP patients who used pessaries complained about bacterial vaginosis in the first year of pessaries setting up, but there were some of POP patients who complained about bacterial vaginosis after 3 years of pessaries setting up.

Table 5 Proportion Onset Incident of Bacterial Vaginosis on POP Patients Based On The Length Use of Pessaries

The Length Use	Positive for BV (%)	Negative for BV (%)	Total (%)
2 weeks - < 6 months	6 (17.65%)	0 (0)	6 (17.65)
≥ 6 months	13 (38.24)	15 (44.12)	28 (82.35)
Total	19	15	34(100)

Table 5 describes that POP patients who used pessaries for more or equal than 6 months were two times higher of suffering BV than those who used pessaries between 2 weeks and less than 6 months.

Table 6 : The Result of Cross Tab Analytic for The Length Use of Pessary and Incident of Bacterial Vaginosis

Test's Name	Results
Fisher Exact Test	0.024
Contingent of Coefficient	0.38

Table 6 describes that there was a significant association between the length use of pessary with the incident of bacterial vaginosis on POP patients, there was a weak association between the length use of pessaries and the incident of BV.

Discussion

Pelvic Organ Prolapse (POP) is a multifactorial disease, even it doesn't lead to mortality, but it does reduce the quality of life, induces mood swings, leads to sexual dysfunction, disturbs women to connect to their social interaction.² Aging is one of the significant risks for the incident of pelvic organ prolapse. Aging is related to estrogen and progesterone declining, which both of them are used to take care of the connective tissue and matrix cellular, they have a role to support the pelvic organ.^{2,7-10} Women who have got history of giving birth once, they have to deal with the probability of 2.6 times higher to suffer POP than women who have never given birth. Women who've got history of giving birth 2 times, they have to deal with an increasing probability to suffer POP 3 times higher than those who have never given birth.^{8,10,11} Vaginal delivery has a significant role in the POP incident, women who had undergone vaginal delivery, they are at risk of suffering from pelvic organ prolapse stage 2 or higher.^{8,11-14}

The Pessary offers high effectiveness and efficient way to overcome POP, beside of its positive profile, pessary users have to deal with the probability of suffering bacterial vaginosis.³ This research revealed that the probability was 5.9, and another research which had done by Alnaif&Drutz, it stated that the probability from suffering bacterial vaginosis for those who used pessaries was 4.37.³ Toma et al have done their research in 2017, their research stated there was a significant rising of probability for those who used pessaries from suffering bacterial vaginosis.¹⁶ Pessary in the vagina was considered as a foreign object, hence anaerobic bacterial dominated the vagina, incident of bacterial vaginosis in POP patients could lead to a potential problem such

as smelling vaginal discharge, urinary tract infection, pelvic inflammatory disease, and adverse pregnancy outcomes.³

There was a significant association between the length use of pessaries and incident of BV, there hasn't been any study which proved this result, Alnaif&Drutz stated that most of pessaries users complained about BV at 6 till 12 months after pessary wearing, still there were some of the pessaries users complained about it after 3 years of pessaries setting up.³ Age and the frequent of pessary release were significantly related to bacterial vaginosis in POP patients, POP patients who were older tend to release the pessaries rarely than those who were younger and sexually active.^{17,18} The frequent of pessaries release which was less than once a week, it induced anaerobic bacteria to dominate vagina and escalated incident of bacterial vaginosis at 3 months after pessaries wearing.¹⁸

Conclusion

There was a significant association between the incident of BV with the use of pessaries and the length use of pessaries. This study revealed that the users of pessaries had to deal with 5.9 higher probabilities to suffer BV than those who didn't use any pessary.

Financial Disclaimers/Conflict of Interest: None

Source of Funding: The funding came from the first author

Ethical Clearance: Researchers have received approval of ethical clearance from the ethics committee of Doctor Soetomo General Hospital Surabaya.

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Overview of Nutritional Status Toddler of Drought Area in the Lumbang Village Indonesia

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Abstract

Background: One of the drought-prone areas is in the village of Lumbang Pasuruan Regency, Indonesia, at an altitude of 100 to 500 meters above sea level with hilly mountain topography and rocky soil structure. Drought-prone areas will indirectly affect the nutritional status of infants and toddlers.

Objective: This type of research was descriptive, the study sample was 102 toddlers who measured weight and height in February 2019.

Methodology: Monitoring the nutritional status of toddlers for six months

Results: 80.2% of toddlers in Lumbang Village with normal nutritional status and found 9.8% of toddlers with underweight and very thin nutritional status.

Conclusions: Parenting from toddlers' parents, economic conditions, young marriage, maturity as a mother, and toddler parenting by a grandmother resulting in the nutritional status of thin and very thin toddlers.

Keywords: *drought-prone areas, Toddler Nutrition Status.*

Introduction

The problem of under-nutrition and over-nutrition in children under five is still a challenge in improving public health in Indonesia ¹. One factor affecting the nutritional status of children is the availability of clean water ². All living things are inseparable from the role of water that is important to them. Besides being consumed, water is used to support human life³. In areas that experience vulnerability and risk of drought, water is something that is very valuable and expensive.

Disruption of water supply in an area if not immediately resolved will lead to nutritional problems especially in infants and toddlers. If there is a nutritional problem and not getting adequate attention is not impossible, babies, children, and toddlers will experience

malnutrition that can continue to become malnutrition, even marasmus, and kwashiorkor ⁴

The disaster map released by the Public Works and Bina Marga Office of Pasuruan Regency in 2019 shows that Lumbang District is a drought-prone area⁵. Lumbang Village is one of the four worst villages experiencing drought in Lumbang Subdistrict, where every dry season, even during the rainy season, is prone to drought. This village is located at an altitude of 100 to 500 meters above sea level. It has a hilly mountain topography and is quite close to groundwater sources that have a large enough water discharge of > 500 liters/second⁵. The soil structure in Lumbang Village is rocky⁶.

As groups are prone to experiencing nutritional disorders, infants and toddlers need special attention. Nutrition status monitoring is one method of supervision and early detection of nutritional problems ¹¹. The history of Lumbang Village which is prone to experiencing drought, so monitoring the nutritional status of infants and toddlers becomes something important besides

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monitoring nutrition that is carried out every month.

Material and Method

The design of this research was descriptive, a research sample with a total population of 102 infants measured as body weight and height in February 2019 in Lumbang Village, Pasuruan, Indonesia. Nutritional status is measured by anthropometric methods by comparing weight and height (Z-Score).

Results

Characteristics

Based on the aspects of geography, topography, geology, and hydrology, Lumbang District is in a mountainous area with an average altitude of 100-500 above sea level (DPL), hilly mountains and quite close to groundwater sources that have a large enough water discharge of > 500 liters / second, the source of Banyubiru spring⁶. Banyubiru is on the border of Grati and Lumbang Districts. Banyubiru distance to Lumbang Village is ± 17 Km. The soil structure in Lumbang Village is rocky soil. Lumbang Village is in a state forest area and near the Bromo mountains.

Lumbang Village is one of the villages in Lumbang District, Pasuruan Regency. Lumbang Village is directly adjacent to Cukurguling Village on the north side, Pancur Village on the west side, Bulukandang Village on the Eastside and state forest on the south side. The location of the village is dominated by state forests on the south side. The total population recorded in 2018 is 2198 inhabitants. This village has a government, health, and education functions in the form of village halls, Family Planning Services - Integrated Health, village maternity huts, and schools.

Drought in Lumbang Village

Based on the disaster map released by the Public Works and Bina Marga Office of Pasuruan Regency

in 2019, placing the Lumbang area in drought-prone areas. Drought in Lumbang Village is a chronic drought. Drought occurs almost throughout the year. In the dry season, it is the peak of the drought, even in the rainy season people still have difficulty accessing water.

For people who have an economic status that can provide it independently by buying water from water trucks. For people who are less able to provide the water they have to wait for water truck, channel assistance from areas where there are still water sources, it is not uncommon for people to take water to a water source that is quite far away, namely in Banyubiru.

At the height of the drought where water is very difficult, there are people who rely solely on water assistance from the Pasuruan Regency Disaster Management Agency / Social Service. Rainwater is a natural good for the people there so that every rain rainwater is a source of meeting water needs.

Living in drought-prone areas can have a negative impact on various aspects of people's lives, the nation, and the country. In the public health sector, nutrition improvement efforts developed through various government and community programs aim to improve the quality of nutrition and food consumption so that it impacts on improving people's nutrition and can further improve the intellect, productivity, and work performance of the community, especially in infants. The impact of health and nutrition that is not good for infants and toddlers will result in irreversible brain organs. If these conditions occur are not resolved properly, it is very likely that the country will lose the opportunity to become a strong nation in future generations⁷.

Distribution of infants by sex, age at the first measurement, age at second measurement, history of body weight at birth, Z-score calculation

Table 1 Characteristics and Toddler Nutrition Status

	Frequency	%
Gender		
Male	58	56.86
Female	44	43.14
Bodyweight at birth		
Normal	91	89.21
Low Body Weight	11	10.79
Toddler age (month)		
0-12	15	14.70
13-24	29	28.43
25-36	22	21.58
37-48	17	16.67
49-60	19	18.62
Nutritional Status (Z score)		
Very thin	4	3.92
Thin	6	5.88
Normal	82	80.39
Fat	10	9.81

Almost all toddlers have normal nutritional status trends, but there are 10 out of 102 toddlers with very thin and underweight nutritional status.

Table 2 Distribution of predisposing factors for the nutritional status of children under five

No	Predisposing factors	Frequency (f)	(%)	Total
1	Toddler parenting			102 (100%)
	Raise alone	28	27.46	
	Cared for with the help of other families	63	61.76	
	Cared for by another family / entrusted	11	10.78	
2	The economic conditions of parents			102 (100%)
	Beneficiary	37	36.28	
	Not a recipient of assistance	65	63.72	
3	Parental marriage age			102 (100%)
	<21 years old	77	75.49	
	> 21 years old	25	24.51	
4	Mother's education			102 (100%)
	Graduated from elementary school	42	41.18	
	Graduated from middle school	44	43.14	
	Graduated from high school	16	15.68	

Predisposing factors that influence the nutritional status of children are parenting, economic conditions, age of marriage, and mother's education. More than half (61.76%) of toddlers raised by parents assisted with other families, almost half (36.28%) of toddlers constituted the beneficiary group, more than half (75.49%) parents of toddlers married <21 years old and almost all mothers of children under five are educated below high school (84.32%).

Discussion

This research was conducted to monitor the nutritional status of toddlers, especially in times of drought. Water availability is thought to be a factor that can affect nutritional status in infants. Toddler under normal conditions is still a group prone to nutritional problems, especially in the drought phase. From this study, it is hoped that drought is not a potential factor for changes in nutritional status in infants. Drought conditions are expected to be a common challenge for the government, health workers, the community, and especially for families.

The research location is a chronic category of drought, even though it is in the mountains and is ± 17 km from a spring, but if the geographical position is higher than the water source, the water cannot be reached up to the top location. This is in line and has been mentioned in previous studies that the drought in Pasuruan Regency was due to limited spring water. The geographical position of regions experiencing drought is in the highlands or above large water sources such as Banyubiru and Umbulan⁹. The rocky soil structure is a contributing factor that makes it difficult to get groundwater. The groundwater drilling process becomes a difficult and high cost.

The nutritional status assessment uses the anthropometric method by measuring weight, height, and age. The results showed the nutritional status of normal toddlers. As many as 80.2%, very thin nutritional status 3.92% and 5.88% thin category. The existence of toddlers with underweight and very underweight categories in this study is a joint evaluation. Toddlers with thin and very thin nutrition are a warning to all parties. Food and nutrition is a problem of various sectors and is the responsibility of the government and society¹². The problem of malnutrition, which until

today has become the government's main program to be resolved, has not yet been entirely successful. Data on children with malnutrition is a separate evaluation for regional stakeholders in particular and the central government in general.

Sanitation and water supply are some of the indirect factors of nutrition experienced by the community¹³. The drought factor for the people in Lumbang Village became routine conditions and every year happens. The local government has taken concrete steps in providing clean water to meet the needs of the community. For people who still have the ability to provide water independently can buy using a water truck. For people who experience financial shortages can only rely on outside help.

Based on interviews with health workers and Family Planning Services - Integrated Health cadres, the nutritional status problems of toddlers are more due to parenting from toddlers' parents where toddlers are cared for along with other family members, economic conditions where toddlers are beneficiaries of the Family Hope Program (10 beneficiaries, marriage young age <21 years, knowledge of mothers under high school. Maturity as a mother figure and foster parenting by a grandmother which causes the nutritional status of children under five in a thin and very thin category. This is consistent with previous research that economic factors, marital age, parenting, knowledge are factors that have a significant effect on the nutritional status of children under five¹⁴

The results of Sofa's research (2017), show factors that are significantly related to the incidence of malnutrition in toddlers, namely history of exclusive breastfeeding, mother's knowledge, environmental health, history of infectious diseases, and consumption of toddler food ($p \leq 0.005$). Risk factors for the incidence of malnutrition in children under five are a history of exclusive breastfeeding (OR = 1.8), maternal knowledge (OR = 1.6), environmental health (OR = 1.8), history of infectious diseases (OR = 1.53), and toddler food consumption⁸

Conclusion

In monitoring the nutritional status of children under five for six months conducted in Lumbang Village

in the category of drought-prone areas, there were still toddlers with an underweight and very underweight nutritional status that required the attention of related parties. Problems with the nutritional status of infants are caused by parenting from toddlers' parents, economic conditions, a marriage of young age, maturity as a mother figure, and parenting by toddlers that affect the nutritional status of toddlers.

Ethical Clearance: The study had prior consent taken from the study subjects for participation in this study.

Source of Funding: Self

Conflict of Interest: Nil.

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The Relationship of Mother Factors and others with MR Immunization Status of Children Age 9 Months - <15 Years in the Implementation of MR : Measles Rubella Campaign in Six Provinces on Java Island, Indonesia, 2017

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Abstract

Background: Indonesia is committed to achieve measles elimination and control rubella by 2020. One of which is by conducting a measles and rubella (MR) immunization campaign in children aged 9 months to <15 years in two phases in 2017 and 2018. The results of the implementation on MR campaign phase 1 on Java Island, 2017 has achieved 95% of coverage target. Several factors influence the success of achieving the coverage.

Method: Used a cross-sectional study design with a sample of 16,413 mothers, the variables studied were the factors in the mother namely age, last education, knowledge, beliefs, attitudes, father's last education, access to information, family support and support of health workers related to MR immunization status of children aged 9 months to <15 years. Analysis of the relationship in this study was assessed in the Prevalence Odds Ratio (POR) and 95% Confident Interval (CI) used chi square and logistic regression analysis.

Results: Based on multivariate result in this study, it was found, the most dominant factor in mothers was access to information with a POR value of 16.724 (95% CI: 13.784-20.291, P<0.0005) compared to other factors. This shows that mothers who did not get information about the implementation of the MR Campaign had a risk of 16,724 times higher not to immunize their children than mothers who received information about it.

Conclusion: Dissemination of information about health to the community is very important to correct beliefs and improve attitude of the community, especially mothers with better communication strategies.

Keywords: *maternal factors, immunization status, MR campaign*

Introduction

Immunization is one of the public health interventions in providing protection from the transmission of diseases that can be prevented by immunization, which have proven to be effective and most economical. Immunization has succeeded in reducing morbidity and mortality in populations at risk since it was first introduced in the wider community in 1974 by WHO⁽¹⁾. Various types of vaccines have been developed and given to populations at risk in order to provide protection against various diseases⁽²⁾.

In 2010, the World Health Assembly committed to reduce morbidity and mortality due to measles and control rubella and CRS in all regions⁽³⁾. The Global Vaccine Action Plan (GVAP) targets measles and rubella to be eliminated by 2020 in five WHO regions, one of the strategy is to provide two doses of vaccine containing measles and rubella through routine and supplementary immunization activity with coverage at least 95% evenly⁽⁴⁾.

Indonesia is committed to achieve measles elimination and rubella control in 2020. For this reason,

a measles and rubella (MR) immunization campaign was conducted to children aged 9 months to <15 years in two phases. Phase 1 in August-September 2017 throughout Java Island and phase 2 August-September 2018 throughout Sumatra, Kalimantan, Sulawesi, Bali, Nusa Tenggara, Maluku and Papua⁽⁴⁾.

The results of the implementation of MR campaign phase 1 in Java Island have achieved the target coverage (95%), although there were still seven districts/cities that have not reached the 95% target. Several factors could influence the success or failure to achieve this.

This study wants to find out the relationship of mothers factors (age, last education, knowledge, beliefs, attitudes), and others (father's last education, access to information, family support and support of health workers) with MR immunization status among children aged 9 months to <15 years in the implementation of MR Campaign in 6 provinces of Java Island, 2017.

Method

This study used a cross sectional study design to determine factors in the mother (age, last education, knowledge, beliefs, attitudes), and others (father's last education, access to information, family support and support of health workers) related to the MR immunization status of 9 month old children to <15 years on the implementation of the MR Campaign in six provinces in Java Island, 2017. The data sources taken from the Independent Evaluation of the MR

Immunization Coverage (MR Campaign) in 6 Provinces in Java, 2017.

Study population was mothers who had children aged 9 months to <15 years during the MR Immunization Campaign in 6 provinces in Java, 2017 who were selected and were willing to be respondents as many as 16,559 people, and the total sample of 16,413 mothers who had fulfilled the inclusion criteria (mothers aged 18 - 65 years and completeness of the data according to the questionnaire) and exclusion criteria (data not suitable or irregularities) of this study.

The dependent variable in this study was the MR immunization status of children aged 9 months to <15 years in the implementation of the MR Campaign in six provinces in Java Island, 2017, and the independent variables (factors in mothers and others) studied were age, last education, knowledge, beliefs, attitudes, father's last education, access to information, family support and support of health workers.

Data analysis was performed using SPSS program. In univariate analysis, summarizing the data uses frequency distribution with a percentage in each group/variable⁽⁵⁾. The relationship of maternal factors with the MR immunization status of children in this study was assessed by looking at the Prevalence Odds Ratio (POR) and 95% Confident Interval (CI) using chi square in bivariate analysis and logistic regression in multivariate analysis.

Results

Table 1. Distribution of mother factors and Immunization MR status of children

Variable	Frequency (n = 16.413)	Proportion (%)
MR Immunization Status		
Yes	15.285	93,1
No	1.128	6,9
Mother's age		
>36,09 years	7.457	45,4
<36,09 years	8.956	54,6
Mother's last education		
High (> SMA/equivalent)	8.571	52,2
Low (<SMA/equivalent)	7.842	47,8
Mother's knowledge		
Well	13.447	81,9
Less	2.966	18,1
Mothers beliefs		
Well	14.739	89,8
Less	1.674	10,2
Mother's attitude		
Well	14.137	86,1
Less	2.276	13,9
Father's last education		
High (> SMA/equivalent)	9.470	57,7
Low (<SMA/equivalent)	6.943	42,3
Information access		
Yes	15.878	96,7
No	535	3,3
Family support		
Yes	15.593	95,0
No	820	5,0
Health Staff support		
Yes	3.996	24,3
No	12.417	75,7

Based on the result in table 1, it was found that as many as 15,285 (93.1%) mothers stated that their children aged 9 months to <15 years had received MR immunization during the MR immunization campaign.

With bivariate analysis using chi square is done to see whether there is a statistical relationship of each factor in the mother studied and others with the status of MR immunization in children.

Table 2. Analysis of Factors in Mothers with Childhood MR Immunization Status

Variable	MR Immunization Status				POR (95% CI)	p-value
	Yes		No			
	n = 15.285	%	n = 1.128	%		
Mother's age						
≥36,09 years	7.002	45,8	455	40,3		
<36,09 years	8.283	54,2	673	59,7	1,250 (1,106-1,414)	0,0005
Mother's last education						
High (≥SMA/equivalent)	7.963	52,1	608	53,9		
Low (<SMA/equivalent)	7.322	47,9	520	46,1	0,930 (0,824-1,050)	0,254
Mother's knowledge						
Well	12.542	82,1	905	80,2		
Less	2.743	17,9	223	19,8	1,127 (0,968-1,312)	0,135
Mothers beliefs						
Well	13.854	90,6	885	78,5		
Less	1.431	9,4	243	21,5	2,658 (2,283-3,095)	0,0005
Mother's attitude						
Well	13.319	87,1	818	72,5		
Less	1.966	12,9	310	27,5	2,567 (2,234-2,950)	0,0005
Father's last education						
High (≥SMA/equivalent)	8.789	57,5	681	60,4		
Low (<SMA/equivalent)	6.496	42,5	447	39,6	0,888 (0,785-1,005)	0,064
Information access						
Yes	15.012	98,2	866	76,8		
No	273	1,8	262	23,2	16,636 (13,857-19,974)	0,0005
Family support						
Yes	14.641	95,8	952	84,4		

Cont... Table 2. Analysis of Factors in Mothers with Childhood MR Immunization Status

No	644	4,2	176	15,6	4,203 (3,514-5,028)	0,0005
Health Officer support						
Yes	3.569	23,3	427	37,9		
No	11.716	76,7	701	62,1	0,500 (0,441-0,567)	0,0005

In bivariate analysis show all the 9 factors in the study, have p-value > 0.25. Therefore all the factors proceed to multivariate analysis.

In multivariate, analysis using logistic regression model. In order to be able to assess the adjusted relationship between independent variables to MR immunization status. A selection is made by assessing independent variables which fits using Likelihood Ratio (Δ LR) test. Adjusted final model that contains variables related to MR immunization status are below.

Table 3. Final Model Mothers Factors and Others Associated with Immunization Status MR Child

Variable	B	Wald Test	POR	95% CI	p-value
Mother's age	0,251	13,866	1,286	1,126-1,467	0,0005
Mother's beliefs	0,601	45,712	1,823	1,532-2,170	0,0005
Mother's attitude	0,621	57,870	1,861	1,586-2,183	0,0005
Father's last education	-0,250	13,301	0,778	0,680-0,891	0,0005
Information access	2,817	815,287	16,724	13,784-20,291	0,0005
Family support	0,997	86,014	2,710	2,195-3,346	0,0005

The final model of the multivariate analysis show factors of the mother and others that are significantly related to MR immunization status namely mother's age, mother's belief, mother's attitude, father's last education, information access and family support. The most dominant factor of mothers and others is access to information with a POR value of 16.724 compared to other factors. However, variable of information access has wide precision (95% CI: 13.784-20.291).

Discussion

Lawrence Green (1980), in his theory states that human behavior that affects their health is determined by three main factors, namely predisposing factors

(knowledge, attitudes, beliefs, values), enabling factors (health facilities or other facilities) and reinforcing factors (attitudes and behavior of health workers and family). A person's behavior about health is determined by knowledge, attitudes, beliefs, and others. Physical facilities and behavioral attitudes of health workers and families will strengthen behavioral change. These three factors support each other and encourage behavior change⁽⁶⁾. Anderson (1974) described the health beliefs model as a determining factor in the use of health services, where there are three main categories of use, namely predisposing characteristics (individual characteristics that cause differences in the use of health services), enabling characteristics (ability to use health services),

and need characteristics (needs to get health services). The need characteristics will provide stimulation to individuals to obtain health services, if predisposing and enabling already exist⁽⁶⁾.

Based on the results of an analysis of nine variables of maternal factors studied at the beginning, only six variables from three factors of Lawrence theory namely predisposing factors (mother's age, mother's trust, mother's attitude), enabling factors (access to information), and reinforcing factors (father's last education, and family support) that have a significant relationship (p -value <0.05) with MR immunization status in children aged 9 months to <15 years in the implementation of the MR Campaign in Six Province on Java Island, 2017. And it found that information access is the most dominant factor influencing the MR immunization status.

Access to information is intended that a person gets information from various existing media both print and electronic that can provide knowledge, strengthen their beliefs and encourage them to take the necessary attitudes and actions as expected. The results of this study are in line with the results obtained by Putri (2019) in Tangerang Regency, Banten Province, where information exposure affects the maternal compliance to immunize basic pentavalent (OR 8,194, 95% CI 3,542-18,955, $P:0,001$)⁽⁷⁾.

In the results of the MR Campaign survey conducted in Iran of 6,838 children, 24 of them (24.2%, 95% CI 16.1-32.3) did not get MR immunization at the time of the campaign because parents did not get information⁽⁸⁾. Muscat (2011) states that lack of information, can cause rejection or delay from parents to immunize their children⁽⁹⁾.

The next factor was family support with POR 2,710 (95% CI 2,195-3,346, $P:0,0005$). This means that mothers who do not have family support will be 2,710 times higher risk of not immunizing their children in the implementation of the MR Campaign than mothers who get family support. Family support becomes a driving force for someone to make an action decision. These result are in line with Putri (2019) research where husband's support significantly influences maternal adherence to immunize basic pentavalent (OR 9,355, 95% CI 3,868-22,627, $P:0,001$)⁽⁷⁾.

Variable Mother's attitude was significantly related to MR immunization status in children in this study, with POR 1,861 (95% CI 1,586-2,183, $P:0,0005$). It shows that mothers who have negative/less attitudes towards MR immunization are 1.861 times higher risk of not immunizing their children than mothers with positive attitudes. A person's attitude arises as a response to the knowledge he gets. However, this attitude does not show the activities or actions as evidence of the attitude taken by someone.

The results of Triana's study (2017), showed that parents' negative attitudes about immunization had a 1.92 times greater risk of not giving complete basic immunization to their babies than mothers who had positive attitudes (95% CI, 1.16-3.19)⁽¹⁰⁾.

Maternal age was significantly related to MR immunization status with a POR of 1.286 (95% CI 1.126-1.467, $P:0.0005$). This means, mothers aged <36.09 years have a 1.228 times higher risk of not immunizing MR in their children compared to mothers $\geq 36,09$ years. These results are in line with a case-control study conducted by Negussie, et al (2016) in Arbegona District, Southern Ethiopia, found that younger mothers have a 9.54 times higher risk (95% CI 5.03-18, 09, $P<0.001$) for not completing immunization of their children compared to older mothers. Younger mothers have a higher risk for failure to complete the immunization of their children compared to older mothers. Age plays an important role in mothers in utilizing health services, because older mothers have more knowledge about health services and have a positive influence on the completeness of immunization of their children compared to younger mothers⁽¹¹⁾.

Father's last education is a factor that can reduce risk with a POR value of 0.778 (95% CI 0.680-0.891, $P:0.0005$). This means that as much as 22.2% of fathers with low education can actually reduce the risk of not immunizing MR in their children compared to fathers with higher education. This is not in line with research conducted by Kantohe, et al (2019) on 'Factors Affecting MR Immunization Interest in Malalayang District, Manado North Sulawesi', where father's education ($P0.729$, OR 0,615) is not related significant with MR immunization⁽¹²⁾. Based on Lewin's theory (1954), the results of this study show that fathers with low education

believe that MR immunization can prevent their children from getting measles and rubella. This is because the father is aware of the perceived susceptibility of his family, perceived seriousness of the diseases, perceived benefits and barriers obtained with immunizations and cues from various mass media⁽¹³⁾.

Conclusions

Findings from this study suggest that policies should be focused on providing better knowledge, correct beliefs and improving attitudes and behaviors the community, especially mothers. Intervention should be done on better communication strategies that could provide community with clear messages specifically on MR vaccination and using a variety of attractive print and electronic media, and that could highlight the importance of MR vaccination. For further research it would be better if the variables to be studied were enriched and with different research designs so that it could illustrate richer results.

Ethical Considerations

Data in this study were sourced from the Independent Evaluation of MR Immunization Coverage (MR Campaign) in 6 Provinces at Java Island, Indonesia, 2017 which was approved by The Research and Community Engagement Ethical Committee of the Faculty of Public Health at the University of Indonesia (Ref: 690/UN2.F10/PPM.00.02/2018).

Competing of Interests

The authors declared that no competing interests exist.

Acknowledgement: The authors would like to thank the MR Immunization Coverage Independent Evaluation Research Team (MR Campaign) in 6 Provinces at Java Island, Indonesia, 2017 for using the data.

Sources of Funding: This research and publication funding is the researcher's own funding.

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Health Ailments: What Tourists in India are Prone to and the Remedies. A Study Based on Tourists who Visited Kerala from January to December 2019

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Abstract

Background: India is a country in South East Asia with a vast and wide variety of geography and culture. To experience India is something magical. The number of international tourists visiting India have increased considerably in this decade when in comparison with last few decades. Tourism has become one of the major sources of income for the development of the country. Changes occurred in the world scenario on behalf of tourism have led to the increased concern in health dimension related to it. The risks faced by tourists during the visit to tropical destinations like India are very high. Travelers are advised to avoid risks in health by the WHO which plays a prominent role in sketching out frequent health issues faced by individuals while travelling internationally.

Objectives: To study the health issues among tourists visiting India. Identify the major causes of these health ailments. To check out the precautions should be adopted by while being in the country in order to avoid health risks.. And finally to analyze the remedies which can be given to the tourists to avoid these issues and to make the trip an ever remembering one.

Methodology: A survey has been conducted among the tourists who visited India from January 2019 to December 2019. The tourists were given questionnaire to get their opinion and experiences regarding health.

Results: The basis for the assessment were the responses shown by the participants in the survey .The survey was conducted among 40 international tourists. Among them 10 had not come across any disease during their trip. Diarrhea was reported to 13 people of survey population. Dengue was reported for 5 people .Malaria was reported to 4 people and hepatitis for 3. Finally, typhoid for 2 of the participants who participated in the survey.

Conclusion:: This assessment gives a detailed description about the health issues encountered by the tourists because of their lack of control over food habits. Most of them were affected with diseases due to their sudden change into spicy food eaters and food tasting from cheap hotels and places which are nearer to slums with polluted water wells.

Keywords: *Tourists, Health, Precautions, Remedies.*

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Introduction

Human travel is as old as human history. Travel has been a part of human life even from its nomadic state.

Tourism has become an industry and it is also one among the major income generator for developing as well as developed countries. The Declaration of

Manila conducted on World Tourism in 1980 defined its significance as “an activity essential to the life of nations because of its direct effects on the social, cultural, educational, and economic sectors of national societies, and on their international relations.”

Travelling between countries help in realizing each other’s culture and geographic versatility. There are a multitude of things one can achieve from visiting and exploring different, unseen places.

Studies reveal that travelling can improve your overall health and develop peace of inner mind, and rejuvenate your creativity. Therefore, you need to take time out from your daily pressures in life, office responsibilities, hectic schedule, and everyday tasks at least once in every year.

Traveling is different for different people. For some, it is about physical movement. For others, it is about journeys of the mind. Traveling is the best way of expanding your horizons. Traveling is overall an amazing experience which also have certain pitfalls to overcome, too. But for some, traveling can have more disadvantages than advantages. It depends on the health condition of the person who travels. Here we consider certain major diseases that are more prone for the visitors to get affected while visiting India and the precautions must be taken by them while visiting India.

Disease Review

1. Diarrhea

Travelers are mostly affected by Traveler’s Diarrhea, which is a common ailment occurs while in travel.

“Diarrhoea is when you have frequent loose watery bowel motions. In most cases, the symptoms resolve on their own within a couple of days without the need for medical treatment.”^[3]

Causes

“Acute diarrhoea is usually caused by a bacterial (eg, salmonella), viral (eg, norovirus or rotavirus), or parasitic (eg, giardia) infection of the bowels. Diarrhoea caused by any of these infections is referred to as gastroenteritis.

Travel to places where the climate or sanitary

practices differ from one’s home country may cause short-term gastroenteritis. This occurs mostly from contaminated food or water and is known as traveler’s diarrhoea. Diarrhoea associated with jet lag will usually subside in a matter of days without treatment.”^[3]

Signs and symptoms

Sign and symptoms determines diarrhoea include loose, fluid motions more than usual times a day. Other symptoms are:

- Feeling to go to toilets frequently.
- Severe abdominal pain and cramping in stomach area.
- Stools with colour change.
- Stools mixed with other body fat.
- Tendency to vomit and nausea.
- Overall body tiredness due to loss of energy .

Treatment

“Because most cases of diarrhoea resolve on their own within a day or two, self-care to relieve symptoms is usually sufficient for treatment:

Avoid caffeine, dairy products, and greasy, high fibre, or sugary foods

Placing a hot water bottle or wheat pack on your stomach, or taking paracetamol (e.g. Panadol), may provide some relief from abdominal cramps

Apply zinc and castor oil ointment or a barrier cream to affected areas if you, or your child, develop a rash (like nappy rash) from the diarrhoea

Avoid taking non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin, ibuprofen, or diclofenac, for pain relief as these medications can cause diarrhoea

Anti-diarrhoeal medications that slow diarrhoea (e.g. Imodium) should be avoided as these drugs prevent your body from getting rid of the bacteria or virus that may have caused the diarrhoea.

To avoid dehydration, drink plenty of liquid every day, taking small, frequent sips. Ideal liquids are clear

thin broths or soups, diluted non-caffeinated sports drinks (e.g. Powerade or Gatorade), and rehydration formulations (e.g. Gastrolyte) that are available without prescription from a pharmacy.” [3]

2. Malaria

“Malaria is a mosquito-borne infectious disease that affects humans and other animals. Malaria causes symptoms that typically include fever, tiredness, vomiting, and headaches. In severe cases it can cause yellow skin, seizures, coma, or death. Symptoms usually begin ten to fifteen days after being bitten by an infected mosquito. If not properly treated, people may have recurrences of the disease months later. In those who have recently survived an infection, reinfection usually causes milder symptoms. This partial resistance disappears over months to years if the person has no continuing exposure to malaria.” [1]

Causes

“It is caused by single-celled microorganisms of the *Plasmodium* group. The disease is most commonly spread by an infected female *Anopheles* mosquito. The mosquito bite introduces the parasites from the mosquito’s saliva into a person’s blood. The parasites travel to the liver where they mature and reproduce. Five species of *Plasmodium* can infect and be spread by humans. Most deaths are caused by *P. falciparum* because *P. vivax*, *P. ovale*, and *P. malariae* generally cause a milder form of malaria. The species *P. knowlesi* rarely causes disease in humans. Malaria is typically diagnosed by the microscopic examination of blood using blood films, or with antigen-based rapid diagnostic tests. Methods that use the polymerase chain reaction to detect the parasite’s DNA have been developed, but are not widely used in areas where malaria is common due to their cost and complexity.” [1]

Treatment

People travelling to places where malaria is common would be better to take protective drugs before, during and after their trip. Treatment also includes antimalarial drugs which are commonly available with the prescription of a medical practitioner.

3. Dengue Fever

“Dengue fever is a mosquito-borne tropical disease caused by the dengue virus. Symptoms typically begin three to fourteen days after infection. These may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin rash. Recovery generally takes two to seven days.” [2]

Causes

“Dengue propagates mainly through female mosquitoes of the *Aedes* genus, *A. aegypti*. The virus is of five kinds. Numerous types of tests are available to diagnose dengue, including discerning antibodies to the virus or its RNA.” [6] Dengue has become a global issue since the World War Second. The disease is common in more than 100 countries, especially in Asia and South America.

Treatment

No particular medicine or method is available to treat dengue fever. If you are diagnosed with dengue fever, it is advised to use pain relievers that contain acetaminophen. It is better to avoid aspirin, which makes bleeding worsen. Taking rest, drinking plenty of water, and consulting your doctor for necessary advices help to overcome dengue.

4. Hepatitis

“Hepatitis refers to an inflammatory condition of the liver. It’s commonly caused by a viral infection, but there are other possible causes of hepatitis. These include autoimmune hepatitis and hepatitis that occurs as a secondary result of medications, drugs, toxins, and alcohol.

Hepatitis is a virus that affects the liver. Hepatitis A is contracted by ingesting contaminated food and water, while Hepatitis B is spread through blood and bodily fluids. Symptoms of hepatitis include fatigue, nausea, poor appetite, stomach pain, dark colored urine, and yellow skin or eyes (jaundice).” [4]

Types of Hepatitis includes:

1. Hepatitis A

“Hepatitis A is infected with the hepatitis A virus

(HAV). This category of hepatitis transmitted by having food or water which are contaminated from the motion of people who are infected with hepatitis A.” [4]

Hepatitis B

Hepatitis B is usually infected through the contact with infectious bodily fluids, such as blood, vaginal secretions or semen, which contains the hepatitis B virus (HBV). “ Drug usage through used injections ,syringes, sexual relationship with an affected partner, or sharing shaving razors with an infected person etc. increase your chance of getting infected with hepatitis B.” [4]

Hepatitis C

“ Hepatitis C is infected through the hepatitis C virus (HCV). Hepatitis C is affected from direct contact with infected bodily fluids, typically through sexual intercourse and drug injections.” [4]

Hepatitis D

“ Delta hepatitis is another name in which hepatitis D is known and it is a serious disease which affects liver. It is spreaded by the hepatitis D virus (HDV). HDV commonly gets transmitted through direct contact with the blood of the person who is infected. It is an uncommon form of hepatitis that only occurs in mutual relation with hepatitis B infection. The presence of hepatitis B contracts the multiplication of hepatitis d virus. Without its presence hepatitis D remains inactive.” [4]

Hepatitis E

Hepatitis E is commonly affected by the hepatitis E virus (HEV). It is also a waterborne disease. Hepatitis E is seen in areas with poor sanitation and usually results from fecal matter that contaminates the supply of water.

5. Typhoid

Causes

“Typhoid is a bacterial infection that can lead to a high fever, diarrhea, and vomiting. It can be fatal. It is caused by the bacteria *Salmonella typhi*. The infection is often passed on through contaminated food and drinking water, and it is more prevalent in places where hand washing is less frequent. It can also be passed on by carriers who do not know they carry the bacteria.”

Symptoms typically start between 6 to 30 days after exposure to the bacteria.” [5]

“ Two significant “ symptoms of typhoid are rash and fever. Fever will be particularly high for typhoid patients and it gradually increases over up to 104 degrees Fahrenheit, or 39 to 40 degrees Celsius. The rash, which does not affect all patients, is of rose-colored spots, especially on the neck and abdomen. Other signs for typhoid include: overall body weakness, severe abdominal pain, constipation which lasts for days and headaches.” [6]

6. Cholera

“ Cholera is an infection that creates severe watery bowel movements like that of diarrhea, which lead to loss of water in the body and even death if remain untreated. It is commonly affected by consuming food or drinking water contaminated with a bacterium namely *Vibrio Cholerae*.

Symptoms of cholera begin as soon as few hours or as long as five days after getting infected. Symptoms are mild typically but sometimes they are serious. Certain infected people shows severe watery diarrhea along with vomiting, which can easily lead to dehydration. “ [6]

Observation and Results

1. Table of Age wise distribution

Age	Number of people	Percentage
20-30	15	37.5
30-40	14	35
40-50	7	17.5
50-60	4	10

2. Table of sex wise distribution

Sex	Number of people	Percentage
Male	25	62.5
Female	15	37.5

3. Socio Economic status wise Distribution

Age	Number of people	Percentage
Poor	0	0
Middle	35	87.5
Rich	5	12.5

4. Diet wise Distribution

Age	Number of people	Percentage
Vegetarian	5	12.5
Mixed	35	87.5

5. Symptom wise distribution

Symptom	Number of people	Percentage
Diarrhea	13	32.5
Malaria Fever	4	10
Hepatitis	3	7.5
Typhoid	2	5
Cholera	2	5
Dengue	5	12.5
Not affected with any disease	10	25

Results

The basis for the assessment of the results were the responses shown by the participants in the survey. The survey was conducted among 40 international tourists and among them 10 that is 25 % had not come across any disease during their trip. Diarrhea was reported to 13 people that are 32.5% of survey population. Dengue was reported for 5 people that are 12.5 % Malaria was reported to 4 people that is 10%, Hepatitis for 3 that is 7.5% Typhoid for 2 that is 5% cholera for 2 people that

is 5 %.

Discussion

India is the land of spices and yummy street foods. Most of the Indian foods are prepared with spices. Many of travelers from other countries may not be used with extra spicy foods. Having Indian foods without any prior experience can make the stomach and intestines of tourists go wrong.

Diarrhea is a usual travel ailment affected by travelers which mainly results from the intake of spicy foods (which are extremely different from the usually used to foods) and contaminated food and water. The stomachs and intestines do not easily accept the change in diet.

Malaria and Dengue fever both of these diseases are transmitted by mosquitoes and are most problematic in places where there is stagnant and contaminated water for mosquitoes to breed, particularly during and just after the rainy season.

Hepatitis is a virus that mainly infects the liver. Hepatitis A is caused often through contaminated food and water which contains the motion of an infected person. Extremely high fever, diarrhea, sweating and vomiting are the important symptoms of hepatitis infected patient.

Cholera is seen in India rarely and the threat of death is also low. Occasional limited outbreaks do occur in India. The common symptom is high watery bowel movement that lasts a few days which is an effect of bacterial infection in the intestine.

“Precaution is better than cure.” India is an amazing country to experience. Keep these things in mind before travelling to India, so that yours will be an evergreen trip. Drinking bottled water while travelling helps in reducing the chance to get affected with contaminated and polluted water. Consume freshly cooked food. Eat from restaurants that are popular and crowded but not empty. Careful while eating washed salads and having fresh fruit juice which can be mixed with polluted water and ice. Non-vegetarians must avoid food from cheap restaurants and railway station vendors since they are not well aware of preparing food in hygiene. Over cooked, spicy red meats can damage the stomach if not used to.

Conclusion

India can be experienced fully only if you are completely healthy. So taking these precautions can make you free from diseases and enjoy the tour in full fledge. Travelers to India can be exposed to various infectious diseases.

Diseases can be prevented by taking necessary steps in your food habits while in the country. India is an over populated land with wide diversity in all aspects. For a first time visitor the land serves some amazing experience in its food culture too. A prior knowledge about the culinary and cuisines in India can help you in taking precautions on what to eat and not. Always have a safe trip and stay healthy.

Conflict of Interest: NIL

Source of Funding: Self

Ethical Clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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The Effect of Giving Ambon Banana (*Musa Paradisiaca*, Sp) To Decrease of Anxiety Levels in Adult Scizofrenia

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Abstract

Introduction: Anxiety disorders are one of the clinical symptoms of schizophrenia. An increase in anxiety symptoms in schizophrenics significantly increases the risk of recurrence, suicide and disrupts social functioning and quality of life. Previous research mentioned a positive effect on banana intake on anxiety reduction.

Aim: This study aims to analyze the effect of ambon bananas on reducing anxiety levels in adult schizophrenics.

Method: This experimental research with a pretest-posttest control group design was conducted at Marzoeki Mahdi Hospital Bogor in May-July 2019. 60 subjects were selected based on inclusion criteria and divided into 5 groups consisting of (1) control group without giving bananas; (2) new patient groups are given 2 bananas per day; (3) new patient groups are given 3 bananas per day; (4) the old patient group was given 2 bananas per day and (5) the old patient group was given 3 bananas per day. Giving bananas for 14 days and weighing one banana \pm 130 grams. Anxiety level was measured using the Hamilton Anxiety Rating Scale (HARS) questionnaire. Posttest anxiety levels were performed after 7 days and 14 days of intervention. Data were analyzed using One Way Anova.

Results: There was a decrease in anxiety levels. The intervention group showed a significantly lower anxiety score at the end of the intervention compared to the control group ($p < 0.05$).

Conclusion: The administration of bananas has a positive effect on reducing anxiety levels in adult schizophrenia patients.

Keywords: ambon banana, anxiety level, schizophrenia

Introduction

In 2012 an estimated 450 million people in the world experienced mental health problems where 3.6% experienced anxiety disorders⁽¹⁾. The statistics of the Indonesian population according to Riskesdas 2018 who experience mental-emotional disorders characterized by anxiety symptoms reach 14 million more people or 6.1% of the total population. Schizophrenia is a fairly

widespread mental disorder experienced in Indonesia, where about 99% of patients in psychiatric hospitals in Indonesia are schizophrenic patients⁽²⁾. In the city of Bogor, the number of people with mental disorders has increased every year. Based on the 2017 annual report of the Marzoeki Mahdi Hospital in Bogor, outpatients experienced an increase in visits to the clinic and inpatients experienced an increase in BOR from 65.78% to 73.16% with the most diagnoses of schizophrenia.

In schizophrenic patients, anxiety disorders are very common. As many as 65% of schizophrenic patients experience anxiety disorders. The more severe positive

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symptoms (delusions, hallucinations) correlate with the severity of anxiety symptoms, but anxiety can occur independently of psychotic symptoms⁽³⁾. Increased anxiety is also often associated with increased depression, suicide, neuropsychological disorders, and cognitive disorders^(4,5). An increased prevalence of anxiety together with the severity of anxiety in schizophrenia is indicated that anxiety disorders significantly increase the risk of recurrence and suicide, disrupt social functioning and quality of life⁽⁶⁾.

Research on the benefits of fruit in people with anxiety has been done. One fruit that is indicated to provide positive benefits for sufferers of anxiety is a banana⁽⁷⁾. Some studies show that bananas can help improve mood. Eating bananas helps improve focus/concentration and mental acuity. In addition, bananas help vitality, which means bananas can increase energy both mentally and physically⁽⁸⁾.

Bananas have potential nutrients for the brain, especially those related to anxiety. Complex carbohydrates in bananas with low glycemic index are associated with increased synthesis of tryptophan in the brain, thereby stimulating the synthesis of the neurotransmitter serotonin associated with anxiety^(9,10).

Method

This research is an experimental study with a pretest-posttest control group design conducted in May - July 2019 at Marzoeeki Mahdi Hospital, Bogor. Subjects were selected based on inclusion criteria: female schizophrenic patients, ages 18 -50 years, moderate to severe anxiety levels, taking standard antipsychotic drugs and willing to participate in research with family consent with agreement on informed consent. Patients who took anti-anxiolytic drugs, had a history of chronic illness, and mental retardation was excluded from this study. The population in this study were female schizophrenia patients who were treated at Marzoeeki Mahdi Hospital, Bogor.

By using the Lemeshow formula (27) 60 subjects were recruited and distributed into five treatment groups consisting of: (1) a control group without bananas; (2) new patient groups are given 2 bananas per day; (3) new patient groups are given 3 bananas per day; (4) the old patient group was given 2 bananas per day and

(5) the old patient group was given 3 bananas per day. New patients are patients who were first hospitalized with a medical diagnosis of schizophrenia and have never received antipsychotic treatment. Old patients are patients who have been hospitalized with a medical diagnosis of schizophrenia, patients who have received antipsychotic treatment. Each group consists of 12 people. Giving bananas for 14 days. The type of banana used in this study was ambon banana (*Musa Paradisiaca*, sp). Banana weight \pm 130 gram/fruit. Before the intervention, both the control group and the intervention group underwent an anxiety level pretest, 24-hour food recall and measurement of body weight and height to calculate nutritional status based on body mass index. After the 7th-day intervention, the posttest 1 anxiety level, 24-hour food recall, and nutritional status were calculated. The intervention was continued until the 14th day then posttest 2 levels of anxiety, 24-hour food recall, and nutritional status were calculated.

HARS (Hamilton Anxiety Rating Scale) questionnaire, selected as a questionnaire used to measure anxiety levels. HARS has been considered a valuable scale for many years and is an internationally accepted standardized test. The validity and reliability test in Indonesia is proven by the value ($r = 0.513-0.786$) and the Cronbach Alpha coefficient which is $\alpha = 0.877$ ⁽¹¹⁾. This questionnaire consisted of 14 question groups. Each of them contains a number of symptoms. Each symptom is given a scale of 0-4 based on the severity of symptoms. The total score obtained was then categorized as anxiety level as follows: (1) <14 = no anxiety; (2) $14-20$ = mild anxiety; (3) $21-27$ = moderate anxiety; (4) $28 - 41$ = severe anxiety; (5) $42-56$ = extreme anxiety⁽¹²⁾.

The data obtained were then processed using SPSS 22 software. One Way Anova statistical test to evaluate the effects of the intervention of the five groups was followed by a Post Hoc difference test to analyze the difference in anxiety level scores with a significance of $p < 0.05$. The study protocol was approved by the Health Research Ethics Commission board of the Sebelas Maret University Surakarta Medical University with ethics number: 93/UN27.06/KEPK/2019 and all procedures involving human subjects were carried out according to research ethics standards.

Results

In table 1 can be seen the characteristics of 60 research subjects viewed from the frequency distribution. Most age is early adulthood (18-35 years) as much as 68.3%. Education varies from uneducated to tertiary graduates. Most of the subjects had primary school education (35%) and most were unemployed/housewives. Most subjects never exercise. Most have more nutritional status (48.3%).

In table 2 it can be seen that the test results indicate a significant difference in the anxiety level score of each treatment group after the intervention ($p < 0.05$). The five treatment groups experienced a decrease in anxiety levels. In the control group only slightly decreased level of anxiety compared to the intervention group.

Then the Post Hoc Bonferroni test was performed to find out which group was most influential after the intervention of giving ambon bananas for 7 days and 14 days (table 3). The test results showed a significant difference in the difference in the level of anxiety between the four banana intervention groups compared with the control group ($p < 0.05$). But there was no difference in the difference in the level of anxiety between groups

of new patients and old patients, by giving bananas 2 pieces/day and 3 pieces/day ($p > 0.05$).

Table 1. Frequency of characteristics of study subjects (n = 60)

Characteristics	Criteria	N	%
Age (Years)	18-35	41	68,3
	36-50	19	31,7
Education	No School	9	15
	Elementary School	21	35
	Junior High School	12	20
	Senior High School	13	21,7
	College	5	8,3
Working Status	Does Not Work	55	91,7
	Work	5	8,3
Sports Activities	Yes	1	1,7
	No	59	98,3
Nutritional Status	Low	15	25
	Normal	16	26,7
	High	29	48,3

Table 2. Differences in anxiety levels of the five treatment groups before and after the intervention (each group n = 12)

Kelompok	Pretest			Posttest 1			Posttest 2		
	Mean	SD	p	Mean	SD	p	Mean	SD	p
Kontrol	36.33	4.19	0,234	30.75	3.84	0,001	27.08	3.55	0,001
New patient 2x	33.17	2.69		25.83	2.82		20.17	3.97	
New patient 3x	33.92	3.82		26.08	1.24		19.25	1.36	
Old patient 2x	33.08	4.80		24.92	1.88		18.83	2.66	
Old patient 3x	34.33	3.20		26.17	1.19		18.67	1.72	

Table 3. Post Hoc Bonferroni Results the difference in the difference between the anxiety levels of the group couples after the intervention

Group 1	Group 2	Posttest 1		Posttest 2	
		Average Difference	p	Average Difference	p
Kontrol	New patient 2x	4.91	<0.001	6.91	<0.001
	New patient 3x	4.66	<0.001	7.83	<0.001
	Old patient 2x	5.83	<0.001	8.25	<0.001
	Old patient 3x	4.58	<0.001	8,41	<0.001
New patient 2x	New patient 3x	-0.25	1.000	0.91	1.000
Old patient 2x	Old patient 3x	-1.25	1.000	0.16	1.000

Discussion

Sweet fleshy bananas can be eaten raw. Bananas are a source of vitamins and sugar, along with bioactive compounds (including fiber and phenolic compounds) have been linked to reducing the risk of degenerative diseases. This bioactive compound has clear therapeutic potential and contributes to antioxidant activity. Phenolics and carotenoids in bananas and other fruits are the main phytochemicals related to human health⁽¹³⁾. Even the World Health Organization (WHO) recommends eating at least 400 grams of fruit per day to reduce the risk of chronic diseases^(14,15).

Bananas also contain vitamins A, C, and E, are antioxidants that can prevent, inhibit or repair damage due to oxidative stress that causes anxiety disorders⁽¹⁶⁾. Combined antioxidants act in various ways, including suppressing the formation of ROS (reactive oxygen species), reducing hydroperoxides and free radicals, stimulating the activity of antioxidant enzymes, or repairing oxidative damage⁽¹⁷⁾.

Bananas contain complex carbohydrates, macronutrients associated with anxiety disorders. Complex carbohydrates with a low glycemic index and contain fiber will increase serotonin levels, a chemical in

the brain that makes calm and stabilizes blood pressure as a way to reduce stress and anxiety disorders^(18,19). Tryptophan contained in bananas is a precursor of serotonin synthesis, has been found to improve mood, reduce anxiety disorders and depression. The hormone insulin, which is triggered through carbohydrate consumption, can increase the synthesis of tryptophan, which ultimately stimulates the synthesis of important neurotransmitters including serotonin⁽⁹⁾.

Bananas also contain minerals including zinc and magnesium, a common element involved in the pathophysiology of anxiety⁽²⁰⁾. Clinical studies report that anxiety patients have low serum zinc levels compared to healthy patients. So zinc is proposed as a marker of stress⁽²¹⁾. Prolonged magnesium deficiency causes a reduction in concentration in the brain, resulting in affective disorders, cardiac arrhythmias, and neuromuscular hyper-excitability⁽²²⁾. Previous studies have shown that low magnesium levels are associated with anxiety disorders and apathy^(23,24).

A study reported that intake of ambon bananas 130 grams/fruit as much as 2 servings/day for 14 days can reduce the intensity of anxiety disorders in adolescent girls aged 15-17 years⁽²⁵⁾. Another study of students

showed that eating one piece of banana every day for 10 days can reduce anxiety disorders compared to eating chocolate or chips⁽²⁶⁾.

Conclusion

There was a significant difference in anxiety levels after giving bananas for 7 days and 14 days between the four intervention groups compared with the control group ($p < 0.05$). In this study, the administration of bananas has the potential to reduce anxiety levels in adult schizophrenia patients.

Conflict of Interest: There is no conflict of interest in this study.

Source of Funding: Funding in this study as a whole is accounted for in the researcher independently. There are no other funding sources.

Ethical Clearance: Taken from the medical faculty of Universitas sebelas maret committee.

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The Relationship between Unintended Pregnancy and Antenatal Care Visit (Analysis of the 2017 Indonesia Demographic and Health Survey Data)

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Abstract

Background: Unintended pregnancies may lead to wide range of health risks for the mother and child. The 2017 Indonesia Demographic and Health Survey (IDHS) data show that 16 percent of pregnancies were unintended pregnancy. Women with unintended pregnancies are at high risk for unhealthy behaviors and had lower tendency to do antenatal care. Antenatal care is an important program to observation, education and medical treatment for pregnant women to obtain a safe pregnancy and childbirth. The objective of this study is to assess the relationship between unintended pregnancy and antenatal care visit using the 2017 IDHS data.

Method: The study was conducted by analyzing the results of the 2017 IDHS data that was carried out on 24 July until 30 September 2017 in 34 provinces in Indonesia by using cross sectional approach. The population in this study was 14.574 women aged 15-49 years who have been pregnant and given birth since January 2012 up to the survey was conducted. The inclusion criterion was the availability of complete data according to variables to be studied in the last pregnancy. The sample in this study using total population that met the inclusion criteria was 14.546. The analysis of the relationship between unintended pregnancy and antenatal care visit applied multivariate Cox regression analysis with 95% confidence interval (CI).

Result: Women with an unintended pregnancy were 1,423 (95% CI 1.308-1.547) more likely to perform nonstandard antenatal care compare to women with intended pregnancy after being controlled by education, parity, pregnancy complications, access to mass media, internet access, husband's support, and participation in deciding healthcare

Conclusion: The unintended pregnancy was significantly related with nonstandard antenatal care visit. It is necessary to increase public knowledge related how to prevent unintended pregnancy by health promotion and awareness to access this information through various media. Case of unintended pregnancy need to be found early, so that health workers can educate pregnant women and families to participate in maintaining the health of mothers and children

Keywords: *Unintended pregnancy, Antenatal care, Reproductive health, Indonesia*

Introduction

Unintended pregnancies may lead to wide range of health risks, such as malnutrition, illness, abuse and neglect, and even death. Globally, 74 million women living in low and middle-income countries have

unintended pregnancies annually. This leads to 25 million unsafe abortions and 47,000 maternal deaths each year¹. Unintended pregnancy is defined as a pregnancy that occurs earlier than desired (mistimed pregnancy) and a pregnancy that occurs when no children or no more children were desired (unwanted pregnancy). The 2017 Indonesia Demographic and Health Survey (IDHS) data show that 84 percent of pregnancies were intended pregnancy, 8 percent were mistimed pregnancy and 7

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percent were unwanted pregnancy².

Women with unintended pregnancies are at high risk for unhealthy behaviors, had significantly lower to do prenatal care and had a higher tendency to abortion³. A study has showed that mothers who experience unintended pregnancy were 1.79(95% CI 1.5-2.1) more likely to not conduct prenatal care compared to mother with an intended pregnancy⁴. Another study also indicate among women with unintended pregnancies there is an increased odds of delayed antenatal care use (OR 1.42; 95% CI, 1:27 to 1:59) and an increased odds of inadequate antenatal care (OR 1.64, 95% CI: 1.47-1.82)⁵.

Pregnancy is a crucial time to promote healthy behaviors and parenting skills. Indonesian Ministry of Health Regulation No. 97 of 2014 mandates that pregnant women should have at least four antenatal care visits during pregnancy, comprising one visit in the first trimester, one visit in the second trimester, and two visits in the third semester⁶. The 2017 IDHS data show that 23.2 percent of antenatal care was not in accordance with the standard². A study showed that 35.1 percent mothers with middle and lower economic who did not perform antenatal care in accordance with the standard were mothers with unintended pregnancy⁴.

Previous studies have examined the factors that cause unintended pregnancy or the determinants of adequate antenatal care, but only few studies have linked the status of unintended pregnancy with antenatal care. This study aims to look at the relationship of unintended pregnancy status with antenatal care visit using the 2017 IDHS data with a large number of samples.

Method

The study was conducted by analyzing the results of the 2017 Indonesia Demographic and Health Survey (IDHS) that was carried out by Statistics Indonesia (BPS) in collaboration with the National Population and Family Planning Board (BKKBN) and Ministry of Health (MOH) on 24 July until 30 September 2017 in 34 provinces in Indonesia by using cross sectional approach.

The population in this study was 14.574 women aged 15-49 years in 34 provinces in Indonesia who have

been pregnant and given birth since January 2012 up to the survey was conducted. The inclusion criterion was the availability of complete data according to variables to be studied in the last pregnancy. The sample in this study using total population that met the inclusion criteria was 14.546.

The dependent variable was antenatal care visit, which was defined as pregnancy-related health care provided by a skilled provider. The Indonesian government's standard of antenatal care visits during pregnancy according to 1-1-2, at least one visit in the first semester, at least one visit in the second semester, and at least two visits in the third semester. The independent variable was unintended pregnancy, which was defined as a pregnancy that occurs earlier than desired (mistimed pregnancy) and a pregnancy that occurs when no children or no more children were desired (unwanted pregnancy). Covariate variables include education, parity, pregnancy complications, access to mass media, internet access, husband support, participation in deciding healthcare. Relationship analysis of the independent and dependent variables employed multivariate Cox regression analysis, and the interpretation of the effects was expressed by PR and a confidence interval of 95%

Results

Based on data from 2017 IDHS data, there were 14.546 women aged 15-49 years who had given birth in the last 5 years before the survey with complete data. Table 1 shows a description of the characteristics of some of the variables. The proportion of nonstandard antenatal care was 23.2 %, while the proportion of unintended pregnancy was 16.5%. Table 2 shows the results of the bivariate analysis that unintended pregnancy status was significantly related with nonstandard antenatal care visit (p value 0.000<0.05). Woman who experience unintended pregnancy were 1,487 (95% CI 1,390-1,591) more likely to perform antenatal care not according to standard compare to women with intended pregnancy. Table 3 shows that all covariates variables tested were significantly related with antenatal care. Table 4 shows the final multivariate model. In this study the final multivariate model is the same as the full model. After conducting the confounding test, all covariate variables had a change of PR <10%, but because in the literature literally all tested variables were related to

unintended pregnancy and antenatal care, all variables were included in the model. After controlling for education, parity, pregnancy complications, access to mass media, internet access, husband's support, participation in deciding healthcare, women with an unintended pregnancy were 1,423 (95% CI 1.308 to 1.547) more likely to perform nonstandard antenatal care compare to women with intended pregnancy.

Table 1. Characteristics of study sample (n=14.456)

Characteristic	N	%
Antenatal Care (ANC)		
Nonstandard	3370	23.2
Standard	11176	76.8
Unintended Pregnancy		
Yes	2399	16.5
No	12 147	83.5
Education		
≤ Elementary School	3659	25.2
> Elementary School	10887	74.8
Residence		
Rural	7321	49.7
Urban	7315	50.3
Parity		
> 2	5182	35.6
≤ 2	9364	64.4
Pregnancy complications		
No	119 91	82.4
Yes	2555	17.6
Access to Mass Media		
Have no access	482	3.3
Have	14064	96.7
Internet access		
Never	7739	53.2
Ever	6807	46.8
Husband's Support		
No	3564	24.5
Yes	10982	75.5
Participation in Deciding Healthcare		
No	1682	11.6
Yes	12864	88.4

Table 2. Relationship between the independent variable and the dependent variable

Unintended Pregnancy	Nonstandard ANC		Standard ANC		Total		PR (95% CI)	p-value
	N	%	N	%	N	%		
Yes	765	31.9	1634	68.1	2399	100	1.487 (1,390-1,591)	0,000*
No	2605	21.4	9542	78.6	12 147	100		
Total	3370	23.2	11176	76.8	14 546	100		

PR = Prevalence Ratio; *significant statistic $p < 0.05$

Table 3. Relationship between the covariates variables and the dependent variable

Variables	Nonstandard ANC		Standard ANC		Total		PR (95% CI)	p-value
	N	%	N	%	N	%		
Education ≤ Elementary School > Elementary School	1134 2236	31.0 20.5	2525 8651	69.0 79.5	3659 10887	100 100	1.509 (1,420-1,604)	0,000*
Parity > 2 ≤2	1460 1910	28.2 20.4	3722 7454	71.8 79.6	5182 9364	100 100	1.381 (1,302-1,465)	0,000*
Pregnancy complications No Yes	2840 530	23.7 20.7	9151 2025	76.3 79.3	11991 2555	100 100	1.142 (1,052-1,240)	0,001*
Access to Mass Media Have no access Have	179 3191	37.1 22.7	303 10 873	62.9 77.3	482 14064	100 100	1.637 (1,452-1,846)	0,000*
Internet access Never Ever	2203 1167	28.5 17.1	5536 5640		7739 6807	100 100	1,660 (1,559 - 1,768)	0,000*
Husband's support No Yes	1250 2120	35.1 19.3	2314 8862	64.9 80.7	3564 10982	100 100	1.817 (1,713-1,927)	0,000*
Participation in Deciding Healthcare No Yes	441 2929	26.2 22.8	1241 9935	73.8 77.2	1682 12864	100 100	1.152 (1,056-1,255)	0,002*

PR = Prevalence Ratio; *significant statistic $p < 0.05$

Table 4. Final Multivariate Model

Variables	PR	95% CI	p-value
Unintended Pregnancy	1,423	1.308 - 1.547	0,000*
Education	1,162	1.073 - 1.259	0,000*
Parity	1.075	0.998 - 1.158	0.055
Pregnancy complications	1.093	0.996 - 1.199	0.061
Access to Mass Media	1,231	1.055 - 1.435	0,008*
Internet access	1,371	1.266 - 1.486	0,000*
Husband's Support	1.556	1.446 - 1.674	0,000*
Participation in Deciding Healthcare	1,133	1.025 - 1.253	0,014*

PR = Prevalence Ratio; *significant statistic $p < 0.05$

Discussion

From this cross-sectional study, we have evaluated that unintended pregnancy, controlled by education, parity, pregnancy complications, access to mass media, internet access, husband's support, participation in deciding healthcare, pose a significant risk of antenatal care. This result is in line with research in Ethiopia which found that women with unintended pregnancy were 69% less likely to receive ANC (AOR=0.31 95%CI : 0.21-0.46) and were four times more likely to have late ANC initiation (AOR= 4.40, 95%CI: 1.70-11.40)⁷.

Women with unintended pregnancies are at high risk for unhealthy behaviors, had significantly lower to do prenatal care and had a higher tendency to abortion³. Women with unintended pregnancy tended to have late antenatal care initiation and receive inadequate antenatal care. Women with unintended pregnancy have a tendency to not recognize the early sign of pregnancy that cause them not to have antenatal care since early pregnancy⁸.

Antenatal care provides an opportunity to deliver interventions for providing health education, improving maternal nutrition and encouraging skilled attendance birth. Antenatal care that does not fit the standard has impact on obstetric complication such as adverse

pregnancy outcomes, maternal morbidity and mortality, premature birth, low birth weight and neonatal death⁹.

Women with unintended pregnancy have less motivation to seek information about pregnancy health because they do not care about the risks that will occur⁴. The information that is owned by women will influence the knowledge and actions to determine antenatal care performed. Women with higher education will be more receptive to the information provided to them and have better knowledge than women with lower education¹⁰.

The result of the 2017 IDHS shows that the higher the birth order, the more likely the births are reported as unintended². Mothers who have more birth history will have less motivation for antenatal care visits because they feel they have enough experience¹¹. The incidence of complications during pregnancy is also associated with antenatal care visits. Pregnant women who experience complications during pregnancy will increase awareness of maternal and child health that will increase the desire to take advantage of adequate antenatal care¹².

Information related to antenatal care is influenced by women's ability to access mass media from newspapers, magazine, television, radio or from the internet. People who can access a lot of information media have better

knowledge than people who can only a little media of information¹³.

Women tend to blame themselves for unintended pregnancies. Husband's support can provide good motivation for pregnant women to do antenatal care¹⁴. The form of husband's support in this study is the willingness of the husband to take the time to accompany his wife in conducting antenatal care visits.

Decision making related to antenatal care is a negotiation process between the husband and wife influenced by the distribution of power among couples in households. Pregnant women who participated in the decision-making process of their own health care are more likely to use antenatal care. In some traditional communities where the patriarchal system is dominated, the husband is the key person in making decisions. In addition, women's bargaining in participation in determining decisions is also influenced by their socioeconomic and educational status. Women with lower socioeconomic and educational status are less likely to be involved in deciding health care and the decision is determined by husband, mother-in-law or senior family members¹⁵.

This study has several limitations both from the research variables and the quality of available data. Variable access to the mass media and the internet in this study is not specifically related to access to reproductive health information, but access to general information. Not all variables that are related to unintended pregnancy and antenatal care visit are available in the 2017 IDHS data, such as maternal knowledge regarding reproductive health and maternal involvement in community organizations. Data of 2017 IDHS are obtained from interviews using questionnaire of activities 5 years before the survey. The accuracy of the information depends on the ability respondent to remember, which impacts the likelihood of information bias. The information bias that occurs is non-differential because it occurs in all groups, both the exposure and non-exposure groups.

Conclusion

Women with unintended pregnancies have a risk of 1.423 (95% CI 1.308 to 1.547) times more likely to perform nonstandard antenatal care compare to women

with intended pregnancy after controlling education, parity, pregnancy complications, access to mass media, internet access, husband's support, and participation in deciding healthcare. Based on the results of this study, coverage of antenatal according to standard can be increased by preventing unintended pregnancy. This can be achieved by increasing public knowledge related to reproductive health and the importance of antenatal care through health promotion, and increasing awareness to access this information through various media. Cases of unintended pregnancy need to be found early, so that health workers can educate pregnant women and families to participate in maintaining the health of mothers and children.

Ethical Considerations: The utilization of the 2017 IDHS data in this study was approved by National Population and Family Planning Board (BKKBN) Indonesia. All respondents in this survey had provided informed consent to be interviewed prior to data collection.

Competing Interests: The authors declared that no competing interest exist.

Acknowledgements: The Author would like to thank the National Population and Family Planning Board (BKKBN) Indonesia who have given permission to access the IDHS data.

Source of Funding: This publication fees was supported by our selves.

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Relationship between Antenatal Care and Low Birth Weight (LBW) Incidence in Indonesia: Secondary Data Analysis of IDHS 2017

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Abstract

Maternal and child health is one indicator of health service performance in a country. The cause of death of 1 month old infant in Southeast Asia, 28% comes from infection, and 20% is caused by premature birth and Low Birth Weight (LBW) (WHO, 2016). According to WHO data, globally In 2015, 20.5 million newborns, an estimated 14.6 per cent of all babies born globally that year, suffered from low birthweight. According to Basic Health Research (Riskesdas) data in 2018, the incidence of low birth weight was 6.2% from 56.6% of under-five children who have birth weight record in Indonesia. LBW is a contributor to neonatal mortality and morbidity. The purpose of this study is to examine the relationship of antenatal care (ANC) with Low Birth Weight (LBW) in Indonesia. The study population was all women interviewed with a history of live births and reported their infant's weight at birth within 5 years before the survey with a total sample of 11,323 people. The variables studied included antenatal care (ANC), maternal age, education, parity, Fe consumption and residence. The static test used is Multiple Logistic Regression to determine the relationship of antenatal care (ANC) with LBW incidence. Bivariate test results found that variables that have the potential to be variables related to birth weight ($p < 0.05$) are antenatal care (ANC) with p value: 0,000, education with p value: 0.032, and Fe consumption with p value: 0.003. Multivariate test showed a significant relationship between antenatal care (ANC) and LBW incidence with OR 1.9 (CI 95%: 1.4-2.7), meaning that mothers who did antenatal care (ANC) examinations less than 4 times had 1.9 times greater risk for giving birth to an infant with Low Birth Weight (LBW) compared to mothers who did antenatal care (ANC) examinations more than 4 times after being controlled by the variable Fe consumption.

Keywords: Antenatal care: LBW: Incidence: Indonesia: IDHS

Introduction

Maternal and child health is one indicator of health service performance in a country. The cause of death of 1 month old infant in Southeast Asia, 28% comes from infection, and 20% of preterm births and Low Birth Weight (LBW) ⁽¹⁾. Based on the results of Indonesia Demographic and Health Survey (IDHS) 2017, the neonatal mortality rate (NMR) was 15 deaths per 1,000 live births. This indicates that 1 in 67 children died in the first month of life and the most common cause of

neonatal death was Low Birth Weight (LBW)⁽²⁾.

Low Birth Weight (LBW) is a infant's birth weight less than 2500 grams regardless of gestational age⁽³⁾. In 2015, 20.5 million newborns, an estimated 14.6 per cent of all babies born globally that year, suffered from low birthweight⁽⁴⁾. Based on the results of IDHS 2017, the incidence of low birth weight was 7% from 94% of mothers who reported birth weight of their babies⁽²⁾. Whereas in 2018, Riskesdas data results reported that the incidence of low birth weight was 6.2% from 56.6% of under-five children who had a birth weight record⁽⁵⁾.

Many factors can influence the incidence of Low Birth Weight (LBW), maternal factors include socio-

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economic status, consumption behavior, calorie intake, urinary tract infections and prenatal care, smoking, genital infections, maternal health and stress⁽⁶⁾. Fetal factors are hydramnios, multiple pregnancy and chromosomal abnormalities. Environmental factors also play a role, namely highland residence, radiation and toxic substances⁽⁷⁾. All these factors can be prevented by preventive measures, for example by promoting health through pregnancy visits or antenatal care. Antenatal care (ANC) is one of the important risk factors for the incidence of Low Birth Weight (LBW)⁽⁸⁾. A case control study conducted at Lao PDR Thailand reported that a complete ANC can help mothers and children gain weight and influence weight loss⁽⁹⁾.

Antenatal care (ANC) is an examination of pregnancy carried out to improve the physical and mental health of pregnant women in an optimal manner, so that they can face labor, childbirth, preparation for exclusive breastfeeding, and the return of normal reproductive health organ. Pregnancy checks are performed at least 4 times during pregnancy, namely 1 time in the first trimester, 1 time in the second trimester, and 2 times in the third trimester⁽¹⁰⁾. One of the goals of antenatal care is to monitor the pregnancy process by ensuring the health of the mother and the fetus in it and to find out the complications as early as possible, so that the fetus that is conceived can grow and develop healthily and optimally. Based on IDHS data in 2017, the percentage of women who received antenatal care (ANC) services at least once (Visit 1) from competent health workers experienced a slight increase, from 93% in IDHS 2007 to 98% in IDHS 2017. Meanwhile, the coverage of visit 4 in antenatal care indicators in IDHS 2017 was 77%, an increase of 11 percent compared to IDHS 2007, which was only 66%. The percentage of women who check their first pregnancy at the age of the womb less than 4 months increased from 75% in IDHS 2007 to 82% in IDHS 2017. The increase in ANC coverage must be accompanied by an increase in the quality of services provided. According to Sistiarani (2008), poor quality of antenatal care is one of the risk factors for LBW⁽¹¹⁾.

Based on the description above, it can be seen that antenatal care (ANC) has a strong role in the occurrence of Low Birth Weight (LBW). Therefore, deeper research needs to be done about the relationship between antenatal care and LBW incidence in Indonesia.

Methods

This research is an analytic research with cross sectional design. The data used are secondary data from Indonesian Demographic and Health Survey in 2017. The study population was all women interviewed with a history of live births and reported their infant's weight in birth in the 5 years before the survey with a total sample of 11,323 people. The inclusion criteria in this study were all women interviewed who had live births and reported their infant's weight at birth within 5 years before the survey. While the exclusion criteria in this study were missing data. The dependent variable in this study was Low Infant Weight (LBW). The independent variables of this study were antenatal care (ANC), maternal age, education, parity, Fe consumption, and area of residence. This study used test strength of 90% and 95% confidence level. Data were analyzed univariate, bivariate and multivariate with complex samples. Bivariate analysis used Chi Square test and multivariate analysis used Multiple Logistic Regression tests.

Result

Based on the table. 1, after weighting the univariate test is performed using complex sample frequencies, from mothers who have given birth to infants in the last 5 years before the survey in Indonesia showed that 6.4% of mothers gave birth to infants with LBW, 4.9% of mothers did ANC <4 times during pregnancy, 26.8% of mothers aged <20 and >35 years, 52.5% of mothers in the low education category, 38.2% of mothers had 1 and >4 children, and 45.3% of mothers took <90 Fe tablets during pregnancy and 48.6% lived in rural areas.

Table 1. Sample Characteristics

Characteristics	Frequency N = 11.323	Percentage (%)
LBW No LBW LBW	10543 780	93,2 6,9
Antenatal Care (ANC) ≥4 times <4 times	10626 697	93,8 6,2
Mother's age No risk (20-35) Risky (<20 and >35)	8220 3103	72,6 27,4
Education High ≥ High school Low < Middle School	5818 5505	51,4 48,6
Parity 2-4 children 1 and >4 children	7027 4296	62,1 37,9
Consumption of Fe ≥ 90 < 90	5671 5652	50,1 49,9
Residence Urban Rural	5995 5328	52,9 47,1

Table 2. Bivariate Analysis

Variables	LBW				Total		OR	P Value
	No		Yes		N	%		
	N	%	N	%				
Antenatal Care (ANC) ≥ 4 times < 4 times	9923 620	93,4 89,0	703 77	6,6 11,0	10626 697	100 100	2,098	0,000
Mother's age No risk (20-35) Risky (<20 dan >35)	7663 2880	93,2 92,8	557 223	6,8 7,2	8220 3103	100 100	0,987	0,902

Cont... Table 2. Bivariate Analysis

Education								
High \geq High school	5461	93,9	357	6,1	5818	100	1,212	0,032
Low < Middle school	5082	92,3	423	7,7	5505	100		
Parity								
2-4 children	6572	93,5	455	6,5	7027	100	1,116	0,247
1 and >4 children	3971	92,4	325	7,6	4296	100		
Consumption of Fe								
≥ 90	5325	93,9	346	6,1	5671	100	1,320	0,003
< 90	5218	92,3	434	7,7	5652	100		
Residence								
Urban	5590	93,2	405	6,8	5995	100	0,954	0,591
Rural	4953	93,0	375	6,9	5328	100		

Bivariate analysis was performed with Chi Square complex sample and obtained antenatal care results (p value: 0,000), age (p value: 0.901), education (p value: 0.032), parity (p value: 0.247), consumption of Fe (p value: 0.003), place of residence (p value: 0,000). There are four variables that have p value <0.25, namely antenatal care, education, parity, and Fe consumption. Furthermore, these variables can be analyzed by multivariate.

Table 3. Multivariate Analysis Model 1

Variables	OR	P value	95% Confidence Interval	
			Lower	Upper
Antenatal care (ANC)	1,900	0,000	1,370	2,637
Education	1,176	0,072	0,985	1,404
Parity	1,131	0,195	0,939	1,361
Consumption of Fe	1,234	0,026	1,025	1,485

After being analyzed using complex sample logistic regression, there are two variables that have a p value > 0.05 namely education and parity, so that both variables are excluded from the model starting from the variable with the largest p value.

Table 4. Multivariate Analysis Model 2

Variables	OR	P value	95% Confidence Interval	
			Lower	Upper
Antenatal care (ANC)	1,941	0,000	1,400	2,689
Fe consumption	1,246	0,019	1,036	1,499

Based on the results of the multivariate analysis above, it can be seen that the variables that are significantly related to LBW are antenatal care (ANC) with Odds Ratio (OR) 1.9 (95% CI: 1.4-2.7), meaning that the mother is undergoing antenatal examination care (ANC) less than 4 times has 1.9 times greater risk for giving birth to an infant with Low Birth Weight (LBW) compared to mothers who do antenatal care (ANC) examinations more than 4 times after being controlled by the variable Fe consumption.

Discussion

Based on the results of this study, it was found that the variable that had the most significant influence in the incidence of Low Birth Weight was antenatal care (ANC). Antenatal care (ANC) is a comprehensive pregnancy check-up performed by health worker at least 4 times during pregnancy, in accordance with care service standards to prevent and recognize pregnancy complications as early as possible, so that the mother and fetus can grow and develop healthily and optimally. The service standard performed at antenatal care (ANC) consists of weighing weight, measuring Mid-Upper Arm Circumference (MUAC), measuring blood pressure, measuring Uterine Fundus Height (UFH), calculating Fetal Heart Rate (FHR), determining fetal presentation, giving Tetanus Toxoid (TT) immunization, giving Fe tablets at least 90 tablets during pregnancy, routine and special laboratory examinations include blood type, hemoglobin, urine protein, blood sugar levels, malaria, syphilis testing, examination of human immunodeficiency virus (HIV) and Acid Fast Bacilli (AFB). Case management and Information and Education Communication (IEC) are carried out effectively⁽¹²⁾.

The results of this study indicate that there is a significant relationship between antenatal care (ANC) and Low Birth Weight (LBW). The results of logistic regression analysis showed that mothers who visited antenatal care (ANC) at least 4 times during pregnancy had a 1.9 times greater chance or risk of giving birth to an infant with Low Birth Weight (LBW) compared to mothers who did antenatal care (ANC) examinations more than 4 times. This is in line with Nurhayani's research (2017) at RSUP Dr. M. Djamil Padang said that mothers who did antenatal care less than 4 times had a risk of 3,692 times to give birth to LBW than

mothers who did complete antenatal care more than 4 times⁽¹³⁾. Dilaram Acharya (2018) in Nepal also stated that mothers who did ANC less than four times, had a risk three times more OR 3.4 (CI 95%: 1.1-10.2) likely to have LBW infants than mothers who did ANC four times or more⁽¹⁴⁾. This is supported by Tayie and Larrey (2008) in Ghana who stated that early antenatal care is very important for good pregnancy outcomes. The study also showed that mothers who did antenatal care (ANC) in the third trimester had 3.2 times more risk of giving birth to infants with normal birth weight compared to mothers who did not do antenatal care (ANC) in the third trimester of pregnancy (CI 95%: 1.9-5.2, P <0.0001)⁽¹⁵⁾.

The cause of LBW is multifactorial, so sometimes it is difficult to take precautions. The risk of occurrence of problems in the body system in LBW infants is greater than the infants with normal birth weight because the infants with LBW conditions are unstable. Perinatal and neonatal deaths in LBW infants are 8 times greater than in normal infants. Causes of death include asphyxia, aspiration, pneumonia, intracranial hemorrhage and hypoglycemia. Nerve damage, speech disorders, and low levels of intelligence will be found if he survives⁽¹⁶⁾. However, pregnant women who routinely carry out antenatal care or ANC pregnant women can obtain comprehensive pregnancy care, so that prevention is expected to be done as early as possible such as an increase in nutrition of pregnant women and compliance with consumption of Fe tablets at least 90 tablets during pregnancy. In accordance with research conducted by Iriyani (2016) at Abdul Wahab Sjahrane Hospital in Samarinda, it is stated that pregnant women who consume less than 90 tablets of Fe tablet had 8.25 times the chance of giving birth to infants with LBW compared to pregnant women who consume more than 90 Fe tablets⁽¹⁷⁾.

Conclusion

Based on data from 11,323 mothers who had given birth to infants in the last 5 years before IDHS 2017, it was found that 6.4% of mothers gave birth to infants with LBW, 4.9% of mothers had ANC <4 times during pregnancy, 26.8% of mothers aged <20 and >35 years, 52.5% of mothers with low education category, 38.2% of mothers had 1 and >4 children, and 45.3% of mothers took <90 Fe tablets during pregnancy and 48.6% lived

in rural area. The results of bivariate and multivariate analysis showed that antenatal care (ANC) was the most influential and dominant factor in the incidence of Low Birth Weight (LBW) after being controlled by Fe consumption variables. Based on the results of the study, researchers recommend increasing maternal adherence in antenatal care (ANC) examinations, which is at least 4 times during pregnancy to prevent and recognize complications as early as possible, such as LBW which can cause neonatal mortality and morbidity.

Acknowledgement: Thanks to Dr. dr. Helda, M. Kes and family who have provided support in completing this research.

Conflic of Interest: The author declare no conflicts of interest in this study.

Source of Funding: Independent (self-based).

Ethical Clearance: This research was conducted after obtaining approval from the National Population and Family Planning Board (BKKBN) via online/website from IDHS 2017 for data processing.

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A New Finding of a Novel Quality of Life Instrument (QOL-IFLS32)

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Abstract

Background: Quality of life (QoL) of productive age has become a concern of researchers as they are the primary resources that determine the progress of a nation.

Aim: This study aim to develop a QoL measurement for productive age in the general population.

Methodology: Based on the concept of quality of life theory, there are 45 question items on the Indonesia Family Life Survey (IFLS) questionnaires used as initial indicators of QoL. The samples of this study were 25,476 productive ages (15-64 years). The Confirmatory Factor Analysis (CFA) first-order excluded 13 items (loading factors < 0.3).

Results: QoL-IFLS32, a reduced number of 32 items encompasses 7 dimensions: well-being, general health, physical, mental, social, community participation, and religion. The instrument meets the fit model criteria (AGFI = 0.917, GFI = 0.928, RMSEA = 0.05). The convergent validity was considered appropriate, with 29 of the 32 items correlated stronger with their assigned scale than a competing scale. 6 of 7 dimensions had construct reliability > 0.6 and good discriminant validity. The discriminant validity value was greater than the correlation between dimensions except for the physical dimension.

Conclusion: This new findings of QoL instrument have acceptability of validity and reliability. The mean score of QoL was greater among ages 15-25, female, and highly educated. Students had a better QoL than worker and homemaker.

Keywords: *quality of life, productive age, validity, CFA*

Introduction

WHO declared that health is not only a change in health status to illness but an evaluation of well-being is needed¹. Well-being is more subjective, it involves a person's perception of whether he feels happy, sad, depressed or anxious². Experts have developed various validated QoL instruments that are appropriate to the

culture and the study objectives. Some use a single-global question³, others use long-multi-item questions^{1,4}. The number of dimensions measured varies⁵, and some even measure 15 dimensions⁶.

There are two types of instruments including disease-specific and general instruments of QoL. General QoL instruments usually discuss general health perception, overall well being, physical function, mental condition and social domain. Whereas disease-specific QoL specifically discusses domains that are directly related to the disease⁷. QoL assessment is often carried out in patients with particular diseases or in the elderly group. It is due to a decrease in their bodily functions. It

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is still rare to assess the QoL amongst working-age in the general population. They are the main human resources that determine the economic progress of a nation. The purpose of this study was to develop a QoL instrument using the Indonesia Family Life Survey questionnaire and assessed QoL amongst productive age (15-64 years) in the general population.

Method

The present study was a population-based cross-sectional study using secondary data of the Indonesia Family Life Survey (IFLS5) 2014⁸. The IFLS is a longitudinal socioeconomic and health survey. The QoL index derived from 45 indicators and 7 domains. Eight questions about subjective wellbeing (overall life satisfaction; level of satisfaction; welfare: now, five years ago, next five years; keeping standards of living today and next five years, meeting household needs, food consumption and health care). Five questions about general health including health perceived (current, one year ago, next year, next 5 years), and health comparison with others. Physical activity (PA) included heavy PA: lifting heavy objects, digging, biking; moderate PA: lifting light objects, mopping; walking; PA had Likert scale 1-3. Ten questions about mental, i.e., disturbed by ordinary things, concentration, depression, hard work, future, anxious, sleep disorder, feeling alone, happiness, get going. 6 questions about the social environment: helping people; being aware of the environment; believing in neighbors, leaving home safely, environmental security, walking alone safely. Five questions related to religion: religious observance; believe in people with same religion; attitudes towards others of different religions. Eight questions of community participations: social gathering; meetings; community service; village improvement; youth activities; religious activity; village security; family welfare program). All the questionnaires above were on the Likert scale 1-4. High scores indicated good results. Reverse coding was performed on negative questions.

Socio-demographic factors consisted of age, gender, marital status, highest education and primary activities

during the past week. Confirmatory factor analysis (CFA) was conducted to evaluate the QoL construct. A high standardized loading factor (LF) indicates a good convergent validity. LF ranging from 0.3–0.5 is medium⁹ and $LF \geq 0.7$ is considered acceptable¹⁰. To estimate the association between items and domains, the maximum likelihood method was conducted. Goodness of fit (GOF) model evaluated by the following statistical indices¹¹: Chi-square (χ^2), adjusted goodness of fit index (AGFI), Goodness of Fit Index (GFI) and the root mean square error of approximation (RMSEA). Good parameters of fit model were GFI and AGFI > .90, and RMSEA < .07¹². Construct reliability (CR) was used in the context of assessing the structure of the measured attribute¹³. CR is an unbiased estimate of general multidimensional measurements for weighted or unweighted dimensions¹⁴. To evaluate the association of QoL with socio-demographic factors, Mann Whitney U and Kruskal Wallis test were performed.

Results and Discussions

CFA conducted by AMOS v.24 to assess the suitability of the factor model proposed. The model consists of 7 dimensions (wellbeing, general health, level of independent, mental health, social environment, community participation, and religion). CFA First-order revealed fit models ($P < 0.05$), but some items had $LF < 0.3$ (welfare for five years ago, health comparison to others, health for next 5 years, future, feeling alone, being aware of the environment, more believe in fellow and neighbor, leaving home safely, religious observance, believe in people with the same religion, social gathering, participate in youth and family welfare program). It indicated low convergent validity and dropped out on further analysis

The results of CFA second-order are shown in table 2. The indicator “helping people” had standardized LF > 1 and a negative error variance (-0.784). It was called a Heywood case. To overcome, the model was re-specified by giving a small positive value (0.005) on the item.

Table 1. Second-Order Confirmatory Analysis

N= 25476

Items	Domain	S.E	t	SLF	P
Wellbeing – QoL		0.006	33.212	0.484	*
General health –QoL		0.003	-14.167	-0.358	*
Level of independence – QoL		0.006	30.862	0.533	*
Psychology – QoL		0.002	-9.199	-0.118	*
Environment – QoL		0.006	27.439	0.344	*
Religion – QoL		0.005	8.082	0.642	*
Community participation – QoL		0.005	9.419	0.101	*
Health care	WB	R		0.652	*
Fullfill of food consumption	WB	0.011	93.56	0.717	*
Meeting household need	WB	0.012	100.48	0.798	*
Keeping living standards next five years	WB	0.011	95.29	0.735	*
Keeping standards of living today	WB	0.011	53.42	0.376	*
Welfare expectation for the next 5 years	WB	0.019	61.84	0.441	*
Level of life satisfaction	WB	0.015	66.53	0.478	*
Health expectation for next year	GH	R		0.621	*
comparison health 1 year ago	GH	0.023	43.5	0.384	*
General health	GH	0.031	45.83	0.717	*
Walking activity	Li	R		0.29	*
Moderate physical activity	Li	0.066	15.78	0.282	*
Heavy physical activity	Li	0.093	14.54	0.432	*
Disturbed by ordinary things	ML	R		0.538	*
Consentration	ML	0.017	71.66	0.659	*
Depression	ML	0.016	73.43	0.691	*
Hard work	ML	0.019	61.13	0.511	*
Anxious	ML	0.017	67.98	0.602	*
Sleep disorder	ML	0.019	60.91	0.508	*
Happiness	ML	0.013	62.87	0.532	*
Get going	ML	0.015	63.14	0.536	*
Helping people	EN	R		2.154**	*
Walking alone safely	EN	0.039	0.002	0.076	*
Environmental security	EN	0.018	0.002	0.031	*
Different religion in the same village	RN	R		0.787	*
Different religion in the same house	RN	0.01	110.33	0.93	*
Neighbors of different religions	RN	0.009	96.94	0.605	*
village security	CP	R		0.429	*
religious activity	CP	0.037	34.85	0.335	*
village improvement	CP	0.041	45.59	0.592	*
community service	CP	0.044	45.56	0.59	*
Community meetings	CP	0.036	43.18	0.496	*

WB: Well-being, GH: General health, Li: Level of independence, ML: Mental, EN: Environment, RN: Religion,

CP: Community participation, R: Reference, *: P<0.05, SLF: Standardized Loading Factor, **: Heywood case

The re-specification model revealed that the model has improved. The “helping people” had SLF = 0.998 (SLF <1) and a positive variance (0.005). The X² of

the revised model increased, but the overall model is not fit (p-value=0.000). It is well known that X² is very sensitive with sample size. and others GOF requirements. Although the GFI and AGFI were lower than the previous model, the value were in range of acceptable GOF (GFI and AGFI> 0.9, RMSEA <0.8). In the revised model, the Heywood case had been resolved. Of the 45 QoL indicators proposed, only 32 items significantly correlated to the QoL.

Table 2. The Goodness of Fit: Second-Order CFA and Respecification Model

Parameter	Second-Order CFA	Respecification Model
	Heywood Case	
Chi-Square	22330	41295
DF	458	459
P-value	0.000	0.000
GFI	0.947	0.928
AGFI	0.939	0.917
RMSEA	0.043	0.05

Abbreviations; DF: the degree of freedom, GFI: goodness of fit index, AGFI: adjusted goodness of fit index, RMSEA: root mean square error of approximation.

Overall model fit in the revised model can be accepted, each QoL construct can be evaluated. Results showed all items are significantly related to the proposed dimensions (t > 1.96, P = 0.05). Then measured construct reliability and variance extracted to test other validity. High-reliability values indicate that indicators are all consistent with their measurements. Generally, acceptable CR > 0.70, whereas CR <0.7 can be accepted for exploratory research.

Table 3. Construct Validity of the QoL-IFLS32

Domain	AVE	CR	Discriminant validity
Wellbeing	0.382	0.803	0.619
General health	0.349	0.603	0.591
Level of independent	0.118	0.276	0.342
Mental health	0.332	0.797	0.576
Social environment	0.393	0.58	0.627
Religion	0.617	0.824	0.785
Community participation	0.248	0.614	0.498

Abbreviation; AVE: average variance extracted, CR: construct reliability

This finding revealed that three domains (well-being, mental, religion) have good construct reliability (CR > 0.7). The other 3 domains including general health, social environment and community participation, have CR ranging from 0.5-0.7. The level of the independent domain concluded as poor reliability (CR = 0.276). Another indicator of validity is discriminant validity (DV), that indicate each construct was different from others. The highest correlation is between community participation and the level of independence ($r = 0.434$).

29.7%), only 1,877 (7.4%) aged 56-64 years. Half were female (54%), and the other was male (46%). Most participants were tertiary school; only a few were highly educated (15.2%). Almost all participants were married (74%), only 1,323 (5.2%) were single. The primary activity of most of the participants (60.6%) was working. 337 (1.3%) participants did not work and tried to find a job. 9.3% of the productive age were still in school, and there were 190 (0.7%) of the productive age who are sick or disabled.

Table 4 presents participant's characteristics. The majority of participants were aged 26-35 years (7571,

Table 4. Characteristics of productive age and Quality of Life

N= 25476

Characteristics			Quality of Life	
	n	%	Mean Rank	P
Age (years)				
15-25	6642	26.1	14096	0.000*
26-35	7571	29.7	13255	
36-45	5733	22.5	12260	
46-55	3653	14.3	11091	
56-64	1877	7.4	10513	
Sex				
Male	11708	46	12007	0.000**
Female	13768	54	13359	
Education				
primary	7251	28.5	10679	0.000*
Secondary	5242	20.5	12256	
Tertiary	9102	35.7	13527	
College	3881	15.2	15385	
Marital status				
Unmarried	5300	20.8	14125	0.000*
Single	1323	5.2	10475	
Married	18853	74	12507	
Primary activity				
Attending school	2371	9.3	15437	0.000*
Working	15451	60.6	12301	
Finding a job	337	1.3	11525	
Retired	141	0.6	11614	
Homemaker	6986	27.4	13079	
Sick/ disable	190	0.7	5016	
Index	Min	Max	Mean	SD
Quality of Life	-7.63	3.85	-0.0003	1.6475

*P<0.05 by Kruskal Wallis Test

**P<0.05 by Mann-Whitney U Test

The QoL mean score is -0.003 (SD = 11.6475) and the data not normally distributed. Mann-Whitney U test revealed that women had better QoL than men (P <0.05). The correlation between QoL sociodemographic factors were performed by the Kruskal Wallis test. The finding showed significant relationship between QoL scores with age, education, marital status and the main activities (P<0.05). The QoL score was the best in young productive ages 15-25 years (Mean rank = 14096). The QoL score decreased with age. This finding proves education has an important effect on QoL. Higher education makes QoL better. Unmarried participants had better QoL than married and single (Mean rank = 14125). Apparently, students have the best QoL than workers and homemakers.

Discussion

The new findings of the validated IFLS32 QoL used for measuring QoL amongst productive ages in the general population. Experts have varying opinions on QoL instruments, which range from single global questioners¹⁵ to multi-dimensional questionnaires¹⁶. Each has advantages, so it is recommended that the right instrument be chosen according to the target population or measurement objectives¹⁶.

The association between demographic factors and QoL was generally in line with the results in the literature. This finding support previous reports that the older had the worst QoL¹⁷ as their emotional sensitivity increases due to loneliness, chronic diseases and continuous hard work to provide the best family's standard of living¹⁸. The younger have fewer burdens and responsibilities, being supported and accommodated by their parents. QoL is still in a debate regarding gender. This study found women have better QoL. It is contrary to the empirical studies¹⁹. Traditions require women to be responsible for children and families have an impact on poor physical and mental health¹⁹. In this study, those who were unmarried found to have good qoL. Previous study revealed a negative association between QoL and family dysfunction or marital disruption²⁰. Someone got married early and had marriage problems declared poor QoL^{20,21}. Low education was associated with

poor QoL. This evidence is consistent with previous studies. Attainment of knowledge is the most significant achievement of human beings¹⁶. It is a key determinant of upward social mobility²².

Limitations of this study should be considered for interpreting the results. This is cross-sectional study and the study design, does not permit causal inferences. Assessment of QoL based on self-reports, no objective measurements. The QoL model matches the GOF parameter but some loading factors were low (0.3-0.5).

Conclusion

QoL-IFLS32 is a novel and validated instrument of QoL. This study provides evidence of the impact of socio-demographic factors on the QoL. Education is important for achieving socio-economic well-being

Conflict of Interest: The authors have no conflicts of interest associated with the material presented in this paper.

Acknowledgment: This study supported by the Indonesian Educational Fund Management Agency (Lembaga Pengelola Dana Pendidikan Indonesia).

Also we thank to RAND for providing IFLS data for public access.

Ethical Clearance: Ethical clearance taken from The Research and Community Engagement Ethical Committee Faculty of Public Health University of Indonesia : 771/UN2.F10/PPM.00.02/2018.

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Frequently Seen Advertising to Negative Body Images Arising in Adolescents in East Java

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Abstract

Background: Mass media has a very important role in the life of millennial society today, this is because the mass media is one of the communication media as well as educational media which are the main choice for information sources for the community. Poor perceptions of body image have proven that it can have consequences that can damage health. Even body image is an important aspect of mental health, self-esteem and well-being.

Method: This study was used a cross-sectional method. The sampling technique in this study was used Random Sampling with a total of 90 students. This research was conducted in Malang. Data collection procedures in this study used the Multidimensional Body-Self Relations Questionnaire-Appearance Scale (MBRSQ-AS) body image questionnaire and the modification of the Stress Level Questionnaire.

Result: This study shows that 70 respondents (77,8%) of the total 90 respondents still had a Advertising beauty products. Spearman correlation value of - 0.430 shows a correlation with moderate strength and a negative correlation direction which means there is an inverse relationship between body image with Ads that are often seen

Conclusion: Advertising of beauty products affects the body image of teenagers. This is likely caused by the mass media ads which is often seen by adolescents. So teenagers are want to look like in the ads that are displayed

Keywords: Advertising, Body Images, Adolescents

Background

Mass media has a very important role in the life of millennial society today, this is because the mass media is one of the communication media as well as educational media which are the main choice for getting information sources for the community¹. Advertising is one type of mass media that is much favored by the public². On a daily basis, the average public is exposed to various types of advertisements and even these advertisements are able to become one of the lifestyle inspirations for the community at large. On the other hand this ad is considered something important to display because it is

related to economic and social growth issues. So it is not uncommon for advertisers to make some manipulations to convince the public to imitate, idolize or even use as advertised³.

Adolescence is a transition from children to adulthood. At this time they tend to be emotionally unstable and often feel insecure, making it easier to convince what has been advertised. Moreover, during adolescence, physical appearance is often a symbol of beauty and femininity as well as the confidence to be able to appeal to the opposite sex. Adolescents who are generally young women are often targeted targets for advertising. The existence of characteristics like the one above that has been inherent in most young women in particular, serve as a reason for advertisers to always display proportional beauty and body features as one of

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the attractions in these advertisements³.

Based on the results of research that has been done mentioned that more than 50% of young women assume that their peers have problems that are not good with their body image⁴. Nearly one-third and half of young women are afraid and worried about their appearance and weight gain or getting fat so often they go on an excessive diet⁵.

Poor perceptions of body image have proven that it can have consequences that can damage health. Even body image is an important aspect of mental health, self-esteem and well-being. In several studies that have been carried out mention that the media always depicts an ideal body image and this is often a factor that causes someone to be like what is advertised so that not infrequently many young women who do ways that tend to be extreme even some teenage girls especially until they arise against eating disorders⁵.

Metode

This study was used a cross-sectional method. The sampling technique in this study was used a Random Sampling System with a total sample of 90 students. This research was conducted in Malang.

Ads that are often seen		
Advertising beauty products	70	77,8 %
Idol figure advertisement	20	22,2 %
Total	90	100 %

Data collection in this study used the Multidimensional Body-Self Relations Questionnaire-Appearance Scale (MBRSQ-AS) body image questionnaire and the modification of the Stress Level Questionnaire which refers to the theory of Distress and Eustress Hans Selye which refers to body image. The questionnaire was then given and filled out by students who were willing to become respondents and had fulfilled the inclusion and exclusion criteria. After all data has been collected and checked for completeness then a data analysis is performed.

Result

Table 1 Characteristics of respondents by age, advertisements viewed, and indicators on body image in Malang Regency.

Characteristics of Respondents	Freq	(%)
Age		
15 years	11	12,1 %
16 years	33	36,7 %
17 years	23	25,6 %
18 years	23	25,6 %
Total	90	100 %
Body image Indicator	Number of question	%
Appearance Evaluation	7	20,4 %
Appearance Orientation	12	38,2 %
Satisfaction with Body Parts	9	25,7 %
Anxiety becomes Fat	4	10,2 %
Categorization of body size	2	5,5 %
Total question	34	100 %

Table 2 Distribution of body image type in Malang Regency.

No	Body image	Frek	(%)
1	Positive body image	47	52,2%
2	Negative body image	43	47,8%
	Total	90	100%

Table 2 shows that 47 respondents (52.2%) of the total 90 respondents still had a negative body image.

Table 3 Distribution of add frequently seen.

Table 3 shows that 70 respondents (77,8%) of the total 90 respondents still had a Advertising beauty products.

Table 4 Spearman’s Rho Test Results Relationship of Body Image with Ads that are often seen

		Ads that are often seen
Body image	R	- 0,430
	P	0,000
	N	90

Table 4 shows that the Spearman’s Rho test obtained a p-value of 0,000 <a (0.05) and a Spearman correlation value of - 0.430 shows a correlation with sufficient strength and a negative correlation direction which means there is an inverse relationship between body image with Ads that are often seen.

Discussion

The results of this study highlight the effects of advertising on the body image of teenage girls, aged between 17 and 19 years at vocational high school studying in Sumberpucung District, Malang Regency. This study focuses on body image owned by teenage girls due to the influence of beauty advertisements. The source of these advertisements comes from the mass media that are seen everyday by them. These sources include Instagram, television, youtube which are very popular among teenagers at the vocational high school. The specific hypothesis of this study is that there will be a negative correlation between exposure to beauty advertisements and body image in adolescent girls, which means that more media exposure is used as an ideal beauty concept, so their body image is more likely to be negative⁵.

This research is supported by other studies which states that the negative feelings they have about their bodies are due to the large contribution of beauty advertisements that they often see⁶. The exposure of advertisements that are often see by them is able to become socio-cultural values or to be a certain understanding of the ideal body concept⁵. Similar research states that the body image they possess is one of the reflection aspects of a person’s mental health, self-esteem, and well-being⁷.

Research on 135 children found that the desire to have a thin body shape is often found around the age of 13 years old. This relates to the mindset or perception

of their parents, especially their mothers, because at the age of adolescence they tend to fulfill their own need, especially in terms of appearance⁸. Another study also revealed that 59% of young women want a thinner body than young men. As many as 42% of girls have wanted their bodies to be thinner. Data collected on 785 women from various ethnic backgrounds was found that only one of these tests showed that black and Hispanic women did not have ideal skinny internalization compared to white women. Indeed, they concluded that socio-cultural factors might now have the same effect in all ethnic groups⁹. The similarity of ethnic groups was also found when they concluded that while white women were slightly more dissatisfied with body image than other ethnic groups, the difference was very small and might indicate that body image problems were not the only the problem¹⁰.

Based on previous research, it was stated that ethnic or racial differences also triggered the emergence of perceptions about the ideal body concept of a relatively thin body. In a study using in-depth interviews with 49 white women and 11 black women it was found that women from the black race tended to have a different perspective on the effects of beauty advertisements compared to women who had white skin¹¹. White respondents indicated that the desire to appear as shown in advertisements to have a thin body was relatively high, and black respondents were more likely to criticize the appearance of a model with a thin body shape and they said that black men wanted women who had bodies that were not too thin¹².

Actually it has also been recognized that the concept of body image always changes from generation to generation. Around the 1950s the ideal body indicator is if you have a curved body with a small waist. But in this era changed that the ideal body is considered a thin body condition. One study found that 94% of women’s magazine covers were depicted with images of ideal thin bodies. Adolescent perceptions, especially young women about advertising, locus of control and self-efficacy are related to eating habits and body image¹³. Based on the results of research that has been done it is mentioned that young women who have a realistic perception of body image and eating habits tend to have a higher internal locus of control and a higher level of self-efficacy¹⁴. Vice versa, women who are satisfied with their weight

tend to have a positive appearance evaluation as part of their body image¹⁵

Another Research states that young girls with white skin who are often exposed to beauty advertisements such as fashion magazines report having a higher level of body dissatisfaction¹⁶. And they also found that young girls with blacks showed that they did not compare themselves to the images in advertisements or even just wanted to look like them because they assumed that beauty was not a white and thin problem¹⁷.

Conclusion

Advertising of beauty products affects the body image of teenagers. this is supported by the mass media which is often seen by adolescents. so teenagers are affected to be like the ads that are displayed

Conflict of Interest Statement : None

Source of Funding: This research was fully funded by Sekolah Tinggi Ilmu Kesehatan Kepanjen

Ethical Clearance: Not required

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Innovation of Millet (Foxtail Millet)-Tuna Cookies on Nutrition Status and Zinc Value for Children Aged 6-24 Months with Less Nutrition Status in Regency of Pacitan – Indonesia

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Abstract

Objective: Indonesia provides support in preparing children as a nation's investment through the Scaling Up Nutrition (SUN) movement. The focus of the SUN movement is meeting the needs of 1000 first day of life in order to reduce the number of malnutrition. Giving millet (foxtail millet)-tuna cookies to children aged 6-24 months with under malnutrition status is one of the innovations in reducing malnutrition. The number of malnutrition children aged 6-24 months reaches 48% in region of Gemaharjo-Pacitan. This product contains 449.03 Kcal and 10.24 gr protein per 100 grams. It is hoped that the provision of these cookies combined with local food will improve nutritional status and zinc values in children aged 6-24 months with under malnutrition status. **Method:** this study was experimental and conducted to 48 infants for 2 months and used a T-test. **Results:** Millet (foxtail millet)-tuna cookies increased nutritional status ($p = 0, 001$) and zinc value ($p = 0.00$). **Conclusion:** Cookies millet (foxtail millet)-tuna can improve nutritional status and zinc values in children aged 6-24 months of malnutrition in Pacitan - Indonesia.

Keywords: Millet-tuna cookies, nutritional status, zinc values, children aged 6-24 months.

Background

According to the World Health Organization (WHO, 2014), 45% of under-five aged childrens' deaths are caused by malnutrition¹⁸. A nutrition status assessment conducted in Indonesia on 2017, shows that 11.3% of children aged 0-23 months are malnutrition (based on weight for age indicators). In Pacitan district alone there are 10.9% of children aged 0-23 months got malnutrition in 2018¹⁴. The problem of malnutrition in children under two years is a problem that needs to be addressed seriously⁶. The attention of developing countries is now shifting from breastfeeding to complementary food which side with breastmilk^{9,18}. WHO recommends that supplementary feeding begin with 6 months with a gradual amount and form¹⁷.

The provision of millet (foxtail millet)-tuna cookies for children aged 6-24, from local foodstuffs (foxtail millet and tuna) is expected to improve nutritional status (weight for age)^{8,10}. Improvement of nutritional status according to age is also a priority in this intervention¹. Body weight index according to age describes relative body weight compared to the age of children³. This index is used to assess children who are underweight or severely underweight¹⁷. It is important to know that a child, whose weight is low according to age, may experience growth problems¹². In addition to nutritional status, this intervention is expected to increase zinc value as one of the trace minerals or micro minerals that are important for life⁵. In children if the amount of zinc absorbed is very small, they will experience improperly growth⁴.

Method

This research was conducted in Regency of Pacitan - Indonesia. The first phase was carried out by testing the millet (foxtail millet)-tuna cookies product, in accordance

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to SNI (Indonesian National Standard) 2973: 2011 and Indonesian Ministry of Health's standard followed by the acceptability test. The targets in this study were children aged 6-24 months with malnutrition status who were joined in twenty "Breastmilk Village" groups, which had agreed to informed consent. The purpose of using the "Breastmilk Village" group is to facilitate the level of obedience in providing interventions. The second phase of this experimental design was an experiment with randomized control (Randomized Controlled Trial / RCT)¹⁵. For sample calculation using G * Power (V.3.1.9.2), the T-test statistic test obtained a minimum sample size of 19 children per group. From the screening results in August 2019 it was found that 48 children aged 6-24 months who were malnutrition, which in this experiment, 48 children aged 6-24 months were targeted for the study (additional samples were needed to anticipate the possibility of selected subjects dropping out, loss to follow-up, or disobedient subject).

So that each group consist of 24 children aged 6-24 months with under malnutrition status (group 1 = the control group was given a biscuit intervention from the Ministry of Health and group 2 = the intervention group was given millet (foxtail millet)-tuna cookies). Ethical clearance, taken from Health Research Ethics Committee Universitas Sebelas Maret (UNS). This research has obtained information on ethical conduct under number 349 / UN27.06 / KEPK / EC / 2019. The study was conducted for 60 days (October-December 2019), with 8 times nutritional education. The nutritional status and zinc values check up conducted before and after the intervention. The final goal in this study is to find out how the two intervention groups compare to their nutritional status and zinc values. In addition, to find out whether the provision of local food can increase nutritional status and zinc values in children aged 6-24 months with under malnutrition status^{9,11}.

Result

Table 1. Characteristics of research subjects

Variabel	Before intervention (biscuit from Ministry of Health) n=24)	After intervention (biscuit from Ministry of Health) n=24)	Before intervention (Millet -Tuna Cookies) n=24)	After intervention (Millet -Tuna Cookies) (n=24)
Age	16,75±3,124		18,71±4,154	
Weight (kg)	7,875±0,5439	8,237±0,6240	8,058±0,7751	8,688±0,7456
Father's Education :				
High School	18 (75%)		14 (58,33%)	
Middle School	6 (25%)		10 (41,67%)	
Mother's Education :				
High school	9 (37,50%)		7 (29,17%)	
Middle school	15 (62,50%)		17 (70,83%)	
Father's occupation :				
Farm worker	3 (12,50%)		5 (20,83%)	
Farmer	19 (79,16%)		16 (66,66%)	
Tradesman	2 (8,34%)		3 (12,51%)	
Occupation :				
Farm worker	3 (12,50%)		4 (16,67%)	
Farmer	17 (70,83%)		16 (66,66%)	
Tradesman	4 (16,67%)		3 (12,50%)	
Government employee			1 (4,17%)	
Family income				
< Rp. 2.000.000	21 (87,5%)		23 (95,83%)	
≥ Rp. 2.000.000	3 (12,5%)		1 (4,17%)	

From table. 1 it can be seen that there was an increased body weight before and after the intervention of the two groups given the biscuit intervention from the Ministry of Health and the intervention of giving millet (foxtail millet)-tuna cookies.

Table 2. Test Results of Nutrition Value for Millet (Foxtail Millet)-Tuna Cookies

Parameter	Unit	Result	Methods
Calorific value	kcal/100 g	449,03	By Calculation
Protein	gr/100 g	10,24	SNI 2973-2011; point A.4
Fat	gr/100 g	15,3	SNI 01-2891-1992; point 8.1
Carbohydrate	gr/100 g	69	By Different

Source: SUCOFINDO Laboratory (2019)

Based on SNI 2973: 11 test, it can be seen that the nutritional content of millet (foxtail millet)-tuna cookies are safe to be consumed chemically and biologically. Also the nutritional content between millet (foxtail millet)-tuna cookies and supplementary feeding from the Ministry of Health for toddlers are compared. SNI and nutrient content test was conducted by the SUCOFINDO laboratory in Surabaya. Ingredients tested were millet (foxtail millet)-tuna cookies with 100 gr of millet and 50 gr of tuna.

Table 3. The Comparison of Nutritional Value of Millet (Foxtail Millet) –Tuna Cookies with Biscuit from the Ministry of Health per 100gr

Nutritional Value	Millet (foxtail millet)-Tuna Cookies	Biscuit from Ministry of Health	Gap
Energy (Kkal)	449,03	450	-0,97
Protein (gr)	10,24	10	0,24
Fat (gr)	15,3	15	0,3
Carbohydrate (gr)	69	70	-1

Source: SUCOFINDO Laboratory (2019)

The nutritional value of millet (foxtail millet)-tuna cookies per 100 grams compared to biscuit from Ministry of Health has a gap that can still be tolerated, which is for energy there is a gap (-0.97 Kcal), protein (0.24 gr), fat (0.3gr), and carbohydrates (-1gr). With nutritional

values adjusted to the Ministry of Health standards, it is expected that the millet (foxtail millet)-tuna cookies which made from local food ingredients, has the same nutritional values which are in accordance to Ministry of Health standards and SNI 2973: 11.

Table 4. T-Test Results for Nutritional Status (Weight for Age) in Two Intervention Groups

Group	n	Mean	SD	p
Before :				
Control	24	-2,31	0,27	0,959
Experiment	24	-2,31	0,24	
After :				
Control	24	-2,24	0,20	0,000
Experiment	24	-1,95	0,19	

Source: Stata 13 data (2019)

From table 4 it can be seen that the nutritional status (weight for age) for the experimental and control groups before the intervention did not differ significantly ($p = 0.959$), it means that the two groups had almost the same intake before the intervention. However, with the intervention (giving millet (foxtail millet)–tuna cookies and biscuits from the Ministry of Health) and nutritional education (eight times) for 60 days, there was a significant difference in nutritional status (weight for age) intake between the experimental and control groups ($p = 0,000$).

Table 5. T-Test Results for Zinc Values in Two Intervention Groups

Group	n	Mean	SD	p
Before :				
Control	24	52,75	6,73	0,398
Experiment	24	54,58	8,08	
After :				
Control	24	71,95	5,97	0,000
Experiment	24	92,75	4,98	

Source: Stata 13 data (2019)

From table 5 it can be seen that the zinc values for the experimental and control groups before the intervention did not differ significantly ($p = 0.398$) it means that the two groups had almost the same intake before the intervention. However, with the intervention (giving of millet (foxtail millet)–tuna cookies and biscuits from the Ministry of Health) and nutritional education (eight times) for 60 days, there was a significant difference in zinc values between the experimental and control groups ($p = 0,000$).

Zinc is one of the micro minerals needed for every cell in the body. Adequacy of this mineral is important in maintaining optimal health. Zinc functions as a cofactor for various enzymes, cell structure and integration, DNA

synthesis, hormonal storage and expenditure, immune-transmission and has a role in the immune system. Zinc deficiency can cause decreased appetite, dermatitis, slow growth, and immunodeficiency⁶.

Pregnant women, breastfeeding mothers, children in their infancy and also parents, those are included in the range of zinc deficiency group. Zinc deficiency experienced by almost all respondents in this study could be caused by the lack of consumption of foods with high zinc content^{7,17}.

Based on laboratory results before and after the intervention, there was an increase with a significant average from 53.66 mg to an average of 82.5 mg of zinc

value. Through this study, the administration of foxtail millet-tuna, and nutritional education for eight times, was able to increase the zinc value on average to 92.15 mg. For the intervention of millet (foxtail millet)-tuna cookies had added higher value than the intervention of biscuits from the Ministry of Health, this is because the zinc content in tuna flour affects the increases in zinc value². The acceptability of millet (foxtail millet)-tuna cookies as additional food is higher than the acceptability of biscuits from the Ministry of Health.

Conclusion

Biscuit interventions from the Ministry of Health and millet (foxtail millet)-tuna cookies (from local food) both improve nutritional status and zinc values in children aged 6-24 months with underweight nutritional status in Pacitan Indonesia. But cookies millet (foxtail millet)-tuna from local food ingredients, with proper processing will increase the nutritional status and zinc value greater in infants aged 6-24 months with under malnutrition status.

Conflict of Interest: There is no conflict of interest in this study.

Source of Funding: Funding in this study as a whole is accounted on the researcher independently. There are no other funding sources.

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Hypertension and Antihypertensive Drugs Toward Erectile Dysfunction

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Abstract

Antihypertensive drugs involved in many sexual problems, particularly erectile dysfunction, and being the main cause of non compliance toward antihypertensive medication. Patient who has hypertension, even the disease progression and medication maybe have some detrimental effects to the sexual function. The aim of this study is identify the effect of hypertension and antihypertensive drugs to the erectile function. A cross-sectional and analytic observational study was conducted in adult community at Redemptor Mundi church, Surabaya, East Java, obtained 30 samples of men aged ≥ 45 years. Research data Included are measuring result of blood pressure, the medication history of antihypertensive and erectile function measured by *International Index of Erectile Function* (IIEF) questionnaire recorded. Outcome of the study show significant correlation between hypertensive condition and IIEF questionnaire result ($p = 0.010$) with negative and moderate strength correlation ($r = - 0.466$). While antihypertensive medication history not showing the difference of questionnaire result between two groups ($p = 0.273$). The conclusion that hypertensive condition have effect toward erectile function, while antihypertensive medication history did not have effect to the erectile function.

Keywords : Hypertension, antihypertensive drugs, erectile disfunction, blood pressure, side effects

Introduction

Hypertension is one of the biggest health problem, nationally and internationally. Based on the results of Basic Health Research (Riskesdas) in 2013, the prevalence of hypertension in Indonesia measured at age ≥ 18 years is 25.8%. Respondents who had normal blood pressure but were taking hypertension drugs were 0.7%. So the prevalence of hypertension in Indonesia is 26.5% (25.8% + 0.7%). Most cases of hypertension in the society are undiagnosed (63.2%).¹ The big prevalence of hypertension became a major concern of the government, especially related to medications and complications.

Antihypertensive therapy is generally involved in many sexual problems, particularly erectile dysfunction, and then considered to be a major cause of non-adherence to anti-hypertensive medications in patients with erectile dysfunction side effects. However data on the causal relationship and its effect are conflicting. In a study on men, beta-blockers and diuretics were associated with

erectile dysfunction, although other studies opposed this finding. In hypertensive case, both disease progression and medication may have adverse effects on sexual function.^{2,3}

Erectile Dysfunction (ED) a sexual dysfunction on males is the inability to achieve or maintain an erection at the time of penetration.⁴ The data shows that vascular problems had been found in most affected individuals. Hypertension is associated with structural and functional abnormalities of blood vessels throughout the body, not excluding blood vessels in the genitals.⁵

Lack of data on sexual health and its correlation to hypertension and its therapy reduces the ability of clinicians to provide counseling to patients about the side effects of treatment and the possibility of sexual problems.² This study observes the effect of hypertension conditions and the use of antihypertensive medication on the sexual function of male subjects, particularly related to erectile dysfunction.

Method

This study is a quantitative research with cross-sectional design and analytic observational method. This step aims to analyze the relationship between the hypertension condition and the use of antihypertensive drugs with erectile dysfunction conditions of the subjects.

The population is the adult community of Redemptor Mundi Catholic Church in Surabaya, East Java which fulfills the research criteria. The inclusion criteria are male, age ≥ 45 years old in February 2018 (at the time of the study), members of the community in Redemptor Mundi Catholic Church Surabaya, a married man with living spouse, has the ability to read, write and speak Indonesian well, willing to follow the study and signed the informed consent. While exclusion criteria are subjects with a history of an infertile disease, penile tissue disorders, acute testicular trauma and undescended testis.

The number of samples selected were 30 samples. The sampling technique is total sampling until the number of samples is fulfilled with the minimum amount to be analyzed using IBM SPSS program.

The data of past medical history of hypertension and hypertensive drug use were obtained through interviews, blood pressure data obtained from measurements and all of them were recorded in Data Logger Sheet (DLS). Blood pressure measurement was done two times with at least 5 minutes rest, the measuring instrument used was the standard mercury sphygmomanometer and stethoscope. The method of measuring blood pressure refers to the guidelines set by JNC VII. While the erectile dysfunction data was obtained through the International Index of Erectile Function (IIEF) questionnaire filled by the subject who were willing to be involved to take data on one chance. The questionnaire was translated into Indonesian language and has been validated. Six questions describing erectile function (question number 1, 2, 3, 4, 5 and 15) were assessed based on the answers given by the subjects (grades 0-5) and the value of each question was summed and classified into several categories: severe dysfunction (1-10), moderate dysfunction (11-16), mild to moderate dysfunction (17-21), mild dysfunction (22-25) and no dysfunction (26-30).⁶

Statistical analysis used were descriptive statistical analysis which was used for the initial characteristics of the study sample, whereas the correlation of hypertension conditions and history of antihypertensive drug use with erectile dysfunction condition analyze using inferential analysis were Spearman correlation test and Contingency Coefficient Test. Data processing through several steps of editing, coding and grouping in tables using IBM SPSS program 17 edition.

Prior to the data retrieval process, samples will get an explanation of the objectives, procedures, benefits, risks of the study and the security of identity confidentiality. As a proof of willingness to participate in this study, patients are required to sign an informed consent. This research upholds the ethical principles of beneficence, the right to self-determination, the right to full disclosure, the right to privacy and the right to fair treatment.

Result

The profile of the research sample involved in this study described in Table 1.

Table 1. Characteristics of Research Sample

Characteristics of Research Sample	Frequency (n)	Percentage (%)
Age group in years		
45-55	8	26.7
56-65	15	50.0
66-75	6	20.0
76-85	1	3.3
Level of Education		
Senior High School graduates/equivalent	17	56.7
Bachelor degree	11	36.7
Master/ Profession	2	6.7
Workload		
Jobless	7	23.3
Working	23	76.7

Source : Primary Data

Table 1 shows that the age group of 56-65 years with 15 samples (50.0%) was the largest. The largest education level group is the senior high school graduates/ equivalent with 17 samples (56.7%), while for working status, most of the sample were working with 23 samples (76.7%).

Table 2 Characteristics of Research Sample Related to Variables

Characteristics of Research Sample	Frequency (n)	Percentage (%)
The history of hypertension		
Ever Suffered	16	53.3
Never	14	46.7
Blood Pressure		
Normal	6	20.0
Pre Hypertension (SBP 120-139, DBP 80-89)	14	46.7
HT stage 1 (SBP 140-159, DBP 90-99)	9	30.0
HT stage 2 (SBP \geq 160, DBP \geq 100)	1	3.3
Antihypertensive medication		
Yes	13	43.3
No	17	56.7
Result from IIEF Questionnaire (Erectile Dysfunction)		
Severe dysfunction (1-10)	4	13.3
Moderate dysfunction (11-16)	3	10.0
Mild to moderate dysfunction (17-21)	4	13.3
Mild dysfunction (22-25)	7	23.3
No dysfunction (26-30)	12	40.0

Source : Primary Data

Table 2 shows the characteristics of the research samples related to the variables in the study, ie the history of hypertensive diseases based on the interviews result, there were 16 samples (53.3%) who answered had suffered from hypertension, most of the sample's blood pressure levels belong to prehypertension category according to JNC VII as 14 samples (46.7%). The history of antihypertensive drugs used showed that as many as 17 samples (56.7%) answered had never used antihypertensive drugs. While the results of the IIEF questionnaire shows that the level of erectile dysfunction disorder mostly belongs to the normal category as 12 samples (40.0%).

Table 3 Types of Antihypertensive Drugs Used

Types of Antihypertensive Drugs	Frequency (n)
Diuretics	0
ACE Inhibitor	2
ARB	0
Beta Blockers	0
CCB	10
Vasodilator	0
Centrally Acting Drugs	0
Combination (Beta Blockers and CCB)	1

Table 3 shows the type of antihypertensive drugs used by sample, where the most used drug category is CCB group (10 samples) and also found a sample using a combination of two kinds of drugs that are CCB group with beta blockers.

The correlation analysis between blood pressure and the results of IIEF questionnaire using Spearman test showed a significant correlation between hypertension condition (described with blood pressure) and the results of the questionnaire of erectile function IIEF ($p = 0.010$) with a negative value and moderate strength ($r = -0.466$). While the history of antihypertensive drugs used did not show any differences in the questionnaire results of erection function in both groups ($p = 0.273$).

Discussion

A man's sexual response reflects a dynamic balance between the forces of stimulation and detention. Any physiological or organic disorder in the central and peripheral mechanisms that regulate erection and detumescence have a clear impact on sexual function. Both high blood pressure and antihypertensive treatment are some of the disorders associated with sexual dysfunction.⁷

Hypertension and Erectile Dysfunction

In this study, ten of 30 subjects (33.3%) had hypertension. Eighteen of 30 samples had erectile dysfunction based on IIEF questionnaires. The result of Spearman's correlation test showed that there was a significant correlation between hypertension and erectile dysfunction ($p = 0.010$). Meanwhile the correlation coefficient showed a negative value ($r = -0.466$, which is a moderate strength of correlation). This means that when the blood pressure is higher, the IIEF questionnaire score will decrease (erectile dysfunction is more severe).

The results of this study are consistent with most studies that accurately emphasize the high prevalence of erectile dysfunction in hypertensive patients compared with normotensives subjects. It has been estimated that people with hypertension have a relative risk of 1.3-6.9 to developed erectile dysfunction. As an example, two studies from South Europe reported that there were higher prevalences of erectile dysfunction in hypertensive patients (45.8% and 35.2% in Spain and Greece respectively), compared to the general populations with normal blood pressure in Spain (18.9%) and in Greece (14.1%).⁵

A study in the southwest of Nigeria also showed information that the higher prevalence of erectile dysfunction was seen in subjects with hypertension, compared to samples with normal blood pressure (75% vs. 56.9% respectively and $p = 0.007$).⁸

Some authors have reported significant associations between hypertension and erectile dysfunction although the mechanism how hypertension can cause erectile dysfunction remains unclear. A theory say the low production of arterial nitric oxide (including penile arteries) in hypertensive patients is the culprit. Nitric oxide is important for the increased production of cyclic

guanosine monophosphate in the penis which causes corpora cavernosa to relax and trigger an erection. Another study author argues that the progression of atherosclerosis in hypertensive patients can contribute to erectile dysfunction.⁸

Penile erection occurs from increased blood flow to the corpora carvenosa and its depend on perfusion pressure, blood vessel dilatation, and cavernosal smooth muscle relaxation. Erectile dysfunction in hypertension probably represents a disorders in some of these factors needed in normal sexual function. Atherosclerotic stenosis or the lowering blood vessel wall-to-lumen-ratio is attributed to decrease blood flow, which impairs the process of penile dilatation.⁹

The correlation between hypertension and sexual dysfunction in men is actually complex, as a reduced sexual function is a natural part of the aging process and the incidence of hypertension increases with age.¹⁰ A study by Akinbode shows that age is the only important predictor factor of the erectile dysfunction occurrence. Subjects with age ≥ 65 years and 46-64 years of age, were three times more likely to suffer from erectile dysfunction than subjects with age ≤ 45 years. Several studies have also reported a strong association between erectile dysfunction and age.⁹

In MMAS (Massachusetts Male Aging Study), after adjustment of the age factor, the higher probability of impotence is directly related to heart disease, diabetes mellitus, anger and depression index, and hypertension.¹¹ This gives a suggestion that the modification of the ages of subjects included in the future study is needed.¹¹

Antihypertensive Medication and Erectile Dysfunction

In this study, when antihypertensive medication as variable correlated with erectile dysfunction disorder experienced by the subjects using the Contingency Coefficient test yielded p -value = 0.273. This result means that antihypertensive medication did not show the different results of erection function questionnaires in each group (taking medication or not).

The results of this analysis differ from some studies that have been mentioned before that the data from three

decades indicate that 2.4% -5.8% of male patients with hypertension have one or more symptoms of sexual dysfunction at various levels of severity during the use of antihypertensive drug therapy.¹²

The prevalence of erectile dysfunction has been found to be higher in patients with treated hypertension than untreated patients and normotensives subjects. In the original MMAS study, a significant correlation between antihypertensive drugs and erectile dysfunction has been observed, however further analysis after some adjustments, reveals that only non-thiazide diuretics are associated with erectile dysfunction events.⁹

There is also a study that says in addition to the hypertensives condition, sexual dysfunction in male hypertensive patients may also be caused by antihypertensive treatment. The available evidence suggests that central sympatholytic agents, β -adrenoreceptor antagonists (β -blockers) and diuretics may be the potential drug for further disruption of sexual function. Calcium channel antagonists and ACE inhibitors may have a neutral effect on the outcome. Previous data from several random and open studies suggest that the angiotensin II (AT) 1 receptor antagonist may also be associated with improved sexual function.¹⁰

Based on the statement from that study, it can be explained the estimates cause of the results in this study is different from some studies on the effects of the use of antihypertensive drugs on erectile dysfunction. The sample in this study which used antihypertensive drugs was small (13 samples) to show the effect of erectile dysfunction. Furthermore, if observed, antihypertensive drugs taken by the sample, not the class of antihypertensive drugs presumed to have a high probability of causing erectile dysfunction (β -blockers and diuretics) but calcium channel blockers and ACE inhibitors are the drugs that give neutral effects.

Some of drug types that can cause erectile dysfunction, such as angiotensin II (Ang II) may modulate erectile activity, it seems like regulate penile arteries blood pressure or modulate neuron signal induction from the sacral spine or brain.⁷ Other mechanism explains that β -blocker and diuretics reduce and maintain blood pressure still lower when blood flows into the penis. This ultimately will inhibit blood flow to the penis, and consequently, hypertensive patients often

have difficulty to get and maintain an erection, resulting in erectile dysfunction.⁴

The wide variations in the prevalence rates of sexual problems written in the literature most likely indicate the differences in research methodology (lack of subject control), type of antihypertensive treatment used, the presence of other disruptive medications, age differences in the study population, and the cultural, social and economic factors.⁷

In clinical practice settings, the prevalence of sexual dysfunction is likely to be higher than reported in clinical studies because the personal nature to this problem often make patients and/or doctors unwilling to discuss the issues openly.⁷

Conclusion

This study concludes that hypertension has an effect on erectile function, while the history of antihypertensive treatment has no effect on erectile function obtained through the IIEF questionnaire.

In general, the results of this study require larger populations and more samples to be able to describe the effect of using antihypertensives from different drug classes. In addition, there is also the need of exclusion criteria for the use of other drugs that can cause side effects of erectile dysfunction.

Ethical Clearance: The ethical clearance of the research issued by Ethical Board of Medicine Faculty Widya Mandala Catholic University Surabaya.

Source of Funding: The source for funding this research are taken from the annual grant of Institute for Research and Community Service (LPPM) in Widya Mandala Catholic University Surabaya

Conflict of Interest: There is no conflict of interest in this research as well as the funding.

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Determinants of Depression Status of Elderly in Kancheepuram District: A Community Based Neighborhood Study

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Abstract

Background: Depression is common psychiatric disorder, affects both mind and body, leads decrease in productivity, disability and increased suicide rates. Prevalence rate ranged from 21 – 83 % in general population and among elderly 21.9% in India. Very few population based studies at village levels from India; hence this study was attempted to find the depression status and associated risk factors among elderly, which may serve as baseline data and also help in planning the health services and policies for them. The objective of the study is to find geriatric depression and its determinants in rural area of kancheepuram district, Tamilnadu.

Methods: A cross sectional study was conducted in selected villages of kancheepuram district Tamilnadu from Nov 2018 to May 2019. 963 Study participants aged 60 years and above both gender were selected by probability proportion to size, administered by pre tested semi structured questionnaire, WHOBREF, CESD after obtained informed consent. Descriptive statistics N, % Mean and SD calculated; Correlation coefficient was calculated at 5% level of significance by using SPSS 16V.

Results: The prevalence of geriatric depression were mild 10%, Moderate 26% and severe 38%. Religion, Socio economic status, work participation, economic dependency, living arrangement and subjective wellbeing, neighborhood variables availability and distance to reach facilities such as transport, health, communication and recreation had significant association with geriatric depression.

Conclusions: This study is first kind of community based neighborhood study at village level from Tamilnadu on prevalence of geriatric depression and its determinants.

Keywords: Geriatric, Quality of life, Depression, neighborhood

Introduction

Depression is common mental health problem among geriatric population.¹ According to WHO global burden of disease report 2004 depression was ranked as third leading cause of burden of disease worldwide.² A

meta-analysis showed that the prevalence rate ranged from 21 – 83 % in general population and among elderly 21.9% in India. Demographic transition, increased life expectancy lead increasing geriatric population with rising chronic non communicable diseases, which expected to have high magnitude of depression.^{2,3}

The studies were describes that geriatric mental health particularly sensitive to ambient neighborhood conditions since elderly people tend to be less mobile and more reliant on local provided services and amenities.⁴ Glass and Balfour proposed the model for neighborhood effect on ageing based on two components supportive and detrimental environments.¹

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Adverse neighborhood attributes increase risk of various health issues independently of the characteristics of the population who live in that neighborhood.⁵ The studies had shown that stressful life, reduced social support and capital are associated with mental disorders among elderly.⁵ Hence this study attempted. The objective was to find geriatric depression and its determinants based on neighborhood components in villages of kancheepuram district, Tamilnadu.

Materials and Method

A cross sectional study was conducted in selected villages of kancheepuram district Tamilnadu from Nov 2018 to April 2019. 963 samples were selected by probability proportional to size, from the spatially clustered villages by neighborhood sampling, considering the prevalence rate of 21.9% of geriatric depression using the formula $n = 4pq \times \text{design effect} / d^2$.

Study participants aged 60 years and above both gender were administered by pre tested semi structured questionnaire along with center for epidemiology scale for depression, after obtained informed consent. The questionnaire consists of geo codes, village code, village name and various domains such as demographic, socio economic, work participation and economic dependency, migration, living arrangement, subjective wellbeing, Morbidity.

The data was collected by personal interview method and entered in ODK forms. Further data was retrieved in MS Excel for missing data analysis. Then, data were merged with neighborhood variables, factor scores of census tract domains, such as Population, area, water, sanitation, communication, recreation, transport and health, both facilities availability and km in distances for the selected villages using their village code as indicator in SPSS.

Descriptive statistics Mean, SD, Percentages were calculated. Inferential statistics such as chi square test and correlation were calculated at 5% level of significance by using SPSS 16V. The ethical clearance was obtained from Institutional Ethics Committee and permission was taken from college authorities to conduct this study.

Results

Among 963 geriatric study participants the

prevalence of depression was approximately 74% and classified mild (10%), moderate (26%), severe (38%) only 26% had no depression. Among 963 study participants majority were female 59.2% and belong to Hindu religion 76.1%. Gender had no significant association but religion had negative correlation with depression $r = -0.363$, $p = 0.001$

50% were illiterate and 44.4% studied up to primary which had no significant relationship with depression status. Majority were in lower middle class 45.1% and 25.4 % were in lower socio economic class, had negative correlation with depression status ($p = 0.001$) lower SES tend to have more depression than upper class.

Nearly 67.7% were living alone and 32.3 % were living with their children; 23.1% were migrated for various reasons such as working, education and marriage of their descendants however, they were not correlated with depression in elderly.

63% were working at present either by choice and economic need. 56.9% had their personal income either by rental, business, agriculture and 10% of them getting government pension. Whatever their income 83.5% spending for their day today needs. Work participation had ($r = 0.292$) positive correlation ($p = 0.001$), structure of work ($r = 0.221$) and reason for work had ($r = 0.13$) positively correlated with depression ($p = 0.001$)

Nearly 77.3% were economically depended with their spouse or children, had significant correlation with their status. 57.5% of study participants live with their spouse and 26% were living alone. Regarding perception about living arrangement half of them told can't say, don't know only and 54.7% told satisfied however there was significant positive correlation ($r = 0.597$) with depression ($p = 0.0001$)

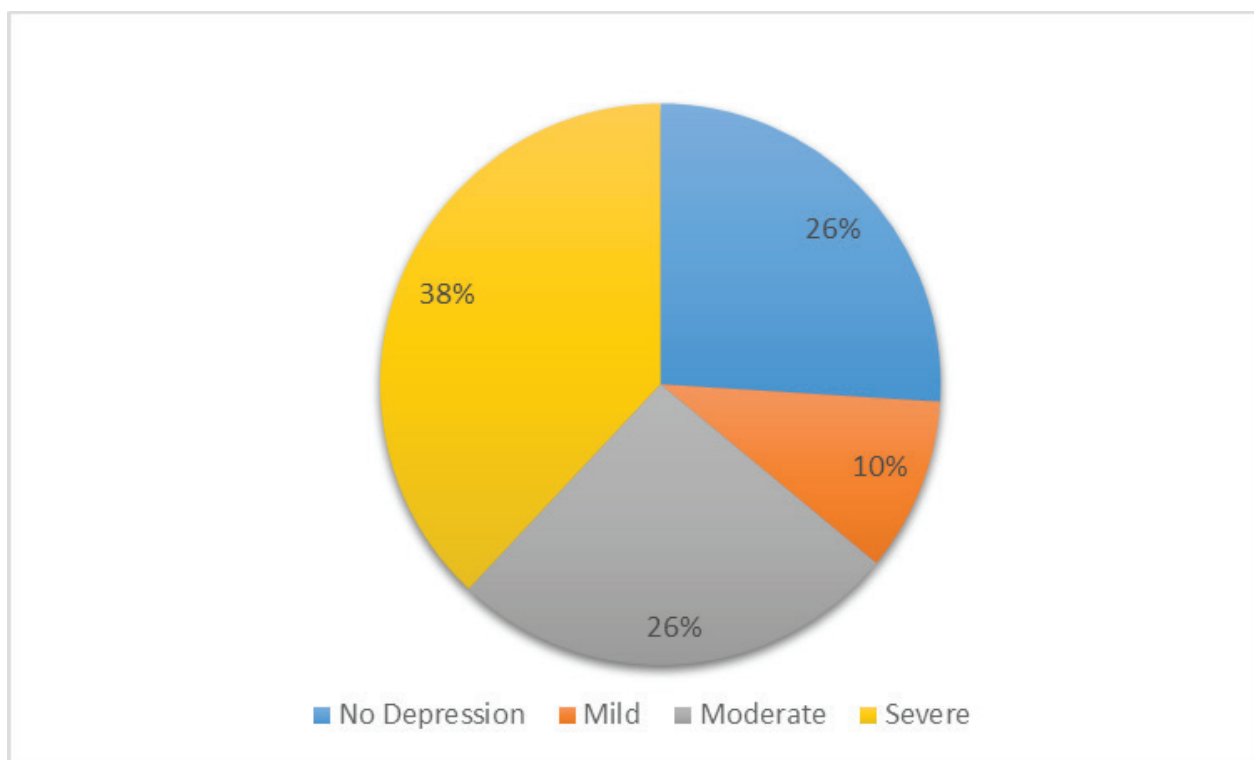
Social interaction had significant relationship with depression those who deprived due to health, safety and financial problems tend to have more depression ($p = 0.001$). Those who need full assistance for their daily activities ($r = 0.616$), instrumental ($r = 0.603$) and loco motor ($r = 0.619$) tend to have increased depression status ($p = 0.0001$).

The neighborhood variables such as water, sanitation, and housing did not had any significant

correlation with depression in elderly. Wherein, lack of communication, health, banking, markets, recreation and transport facilities and their distance to reach these facilities had significant correlation with geriatric depression (p =0.001)

The quality of life was assessed with four domains such as physical, psychological, social and environmental

by WHO BREF scale. These mean scores had significant negative correlation with depression in elderly; which interprets increase in quality of life score leads decreased level of depression. Physical domain 64.9%, psychological domain 64.2%, Social relationship 71.7 % and Environmental domain had 64.1% statistically significant negative correlation with depression status respectively in elderly (p=0.0001)



Graph 1: Prevalence of Geriatric depression among study Participants

Table1: Association of demographic, socio environmental factors with geriatric depression

Demographic Variables	Correlation (p value)
Age	- 20.0 % (0.01)
Religion	- 36.3 % (0.01)
Housing	- 16.0 % (0.01)
Work Participation	29.2 % (0.01)
Economic Support, Assets	- 44.0 % (0.001)

Table 2: Association of Living arrangements, Migration and Social Interaction with geriatric depression

Living Arrangements	Correlation (p value)
Type of living	16.5 % (0.01)
Perception	59.7 % (0.001)
Preferable support	18.8 % (0.01)
Money	21.8 % (0.01)
Involvement in decision making	41.7 % (0.001)
Social Interaction	- 27.5 % (0.01)

Table 3: Association of subjective wellbeing, ADL, Loco motor with geriatric depression

Subjective Well Being, ADL, Loco Motor	Correlation (p value)
SWB: Self rated health	-65.1 % (0.0001)
SWB: Current health status	-66.2 % (0.0001)
SWB: Last one year	-55.5 % (0.0001)
Active Daily Living	-61.6 % (0.0001)
Instrumental (need assistance)	- 60.3 % (0.0001)
Loco Motor (need assistance)	- 61.9 % (0.0001)

Table 4: Association of Quality of life with depression status among elderly

Quality of Life of Elderly	Mean \pm SD	Correlation (p value)
Physical Domain	66.8 \pm 21.42	- 64.9% (0.0001)
Psychosocial Domain	55.26 \pm 18.4	- 64.2% (0.0001)
Social Relationship Domain	68.72 \pm 21.66	- 71.7% (0.0001)
Environmental Domain	65.34 \pm 23.29	-64.1% (0.0001)

Discussion

In this study majority were female participants (59.2%) which was similar in study by Anil et al (58.8%) and Poongothai et al (54.6%).⁶⁻⁸ approximately, half of them were not literate in current study which was similar to Piramanayagam et al (78%).^{7,8} Three fourth of the participants belong to lower and lower middle class which was almost similar to Syed et al.^{8,9}

Two third of study participants were living alone which was more than the study done by Usha et al (55%) and higher compare to 2011 census of tamilnadu (16%).¹² 63% of them still working which was higher than the 2011 census which says that 30% in men and 20% in female.¹² half of the elderly people had personal income wherein the other were dependent on their descendants.

The prevalence of depression was graded as mild (10%), moderate (26%), severe (38%) which was higher than median prevalence rate of India.^{14,15} in this study there is significant impact on geriatric depression due to age, religion and type of housing which was almost similar to most of Indian studies.¹⁴⁻¹⁸ Work participation and nature of work had reason for working had significant positive correlation with geriatric depression.^{14, 15}

Even though water and sanitation facilities not having any impact on depression but the other facilities such as availability of grocery shops and market, health facilities, recreation facilities and communication facilities had significant impact on geriatric depression. These natural neighborhood clusters according to these physical and social domains had significant relationship with their mental health. Those who live with good amenities neighborhood tend to live with good mental health compare to those who live poor neighborhood. Similar results were found with studies done by Kubzansky et al (2005) and Scootman et al (2007).^{4, 5,19}

All most all the study participants had one or more diseases; their quality of life was assessed and the mean scores of domains were 66.8 ± 21.42 , 55.26 ± 18.4 , 68.72 ± 21.66 , 65.34 ± 23.29 respectively; these scores were indirectly proportional to depression among elderly which was almost similar to other studies.^{10, 11, 13}

Conclusion

This study is first kind of community based neighborhood study at village level from Tamilnadu on prevalence of geriatric depression and its determinants. There were increased depression status at villages of kancheepuram district. It is so important to identify association of neighborhood characteristics along with individual level assessment with depression status in elderly. Such studies will help us to plan structural interventions and improving health of elderly.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: The ethical clearance was obtained from institutional ethical committee of KIMSRC.

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Evaluation of Safety Climate and Service Performance of Inpatient Care Unit of Public Hospital

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Abstract

Background: Safety climate is an important part of an organization because it is related to the hospital performance and therefore it needs to be evaluated. The purpose of this study is to evaluate the safety climate that affects the performance of inpatient care services in public hospitals, including job satisfaction, job performance, work productivity and patient satisfaction. **Method:** The study was conducted involving 256 respondents of health workers and patients in the inpatient care unit at two public hospitals in Indonesia. The study was conducted using a questionnaire covering the dimensions of leadership, staff, communication, and cooperation. **Results:** Safety climate in the inpatient care unit at the hospital had a positive relationship with job satisfaction, job performance and work productivity, and does not correlate to the improvement of patient satisfaction. Hospital performance in sequence for the level of job satisfaction, job performance, and work productivity is classified as very good, and the level of patient satisfaction is good. Respondents consider knowledge and experience in handling safety still needs to be improved. To increase awareness of climate safety, the leaders make safety as a culture that must be obeyed by all personals. **Conclusion:** Safety climate in two public hospitals affects job satisfaction, job performance, and work productivity, but does not affect patient satisfaction.

Keywords: *Safety climate, Service performance, Inpatient Care Unit.*

Introduction

Safety climate in an organization is very important, because it determines the productivity of an organization¹. The hospital unit as a health organization that organizes health services consisting of inpatient, outpatient and emergency services must pay attention to the safety climate as a guarantee of the safety and health of the workers and patients. A good safety climate will be able to create a sense of security for workers and

affect the level of service to patients². Hospitals as public service units must have a good safety climate in order to obtain excellent work productivity, because workers feel satisfied and comfortable doing work that is their responsibility^{3,4}.

Several studies have been conducted to evaluate the safety climate in health organizations, especially those related to culture that affect safety behavior in hospitals^{5,6}. Some parameters used to evaluate the safety climate include the leadership, the staff, communication, and teamwork. Safety climate has also been applied in other organizations^{7,8}. The safety climate in hospitals has an important role in the formation of safety programs that have helped efforts to maintain patient safety with a focus on developing a strong safety climate. Safety climate can differ between institutions, depending on the type of service provided. Safety climate measurement is generally intended to assess the commitment of

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management to the application of safety⁹. Hospitals need a good safety climate because it deals with health workers with the risks faced in carrying out tasks according to the type of task and services. Parameters that affect the safety climate must be maintained well and always be improved^{10,11}. Evaluation of the safety climate in the inpatient care unit of general hospital in Indonesia needs attention as the conditions occur in inpatient care units greatly affect the quality of hospital performance¹². This study aims to evaluate the safety climate and service performance of inpatient care units in two hospitals in Indonesia. Research is focused on recognizing the relationship between safety climate with job satisfaction, patient satisfaction, job performance and work productivity.

Research Method

Research subjects: The subjects of this study were doctors, nurses and midwives who worked in the inpatient care unit, and patients or families of patients who used inpatient care services at the hospitals. The selection of two hospitals (A and B) as government-owned public hospitals with plenary level accreditation based on the Hospital Accreditation Assessment. The unit of analysis in this study is individuals, namely health workers and patients in the target hospitals.

Population and sample: The population was all health workers and patients in the inpatient care unit at two public hospitals in Yogyakarta, Indonesia with 256 samples.

Research instruments: The research instrument consisted of a standardized questionnaire to evaluate service performance related to safety climate¹³.

Research procedure: The research stages consist of a preliminary study, provision of instrument sets, data collection and analysis, and drawing conclusions and recommendations. A preliminary study was conducted to prepare the material of safety climate that will be evaluated in hospitals in accordance with applicable regulations in Indonesia. Provision of the research instruments is carried out to assess the safety climate related to patient satisfaction, job satisfaction, work productivity and job performance to make the questions are adequate and easily understood by the respondents. Data processing is included the selection and determination of respondents, distribution of questionnaires, data collection, analysis of the relationships between variables, and draw conclusions and recommendations.

Results

Respondents Characteristic

The respondents that are voluntary take part in the study consisted of staffs and the patients as summarised in Table 1. The response rate is high (91%) which was categorised as good and has been counted to be sufficient as representative to the population. The samples have been analysed for normality ($p\text{-value } 0.00 < p < 0.05$) and found they are not normally distributed.

Table 1. The distribution of samples that are take part in the survey in two hospitals (A = State Public Hospital, B = Academic Hospital).

Respondent	Selected respondents (Sample)	Volunteer respondents take part to fill out the questionnaire	Response Rate
Health workers in A	72	66	92%
Patients in A	68	66	97%
Health workers in B	72	63	88%
Patients in B	68	61	90%
Total	280	256	91%

Climate Safety and Performance of Hospital Services

The performance of public hospital on inpatient care services has been evaluated based on the relationship between safety climate with job satisfaction, patient satisfaction, job performance and work productivity. Respondents opinions is summarized in Table 2.

Table 2. Respondents' opinions on safety climate and service performance of inpatient care unit ($n = 256$).

No	Parameters	Components Evaluation	Respondents Opinion*		
			A	B	Average
1	Job satisfaction	Payrole and insentive, supervision, work condition, partnership, security, and opportunities and staff achievement	2.91±0.18	2.85±0.22	2.88±0.18
2	Patient satisfaction	Team work, leadership, communication, organization staff	3.25±0.22	3.23±0.28	3.24±0.24
3	Job performance	Work achievement, staffs capability, and behavior and work relationship	3.40±0.12	3.46±0.16	3.43±0.13
4	Work productivity	Work qualification, motivation, job orientation, maturity of thinking, social skills	3.39±0.40	3.48±0.39	3.44±0.38
	Average		3.24±0.23	3.26±0.26	3.25±0.23

*Marking criteria: 4 = very good; 3 = good; 2 = poor, and 1 = very poor

From the analysis results, it is known that the safety climate and job satisfaction in the inpatient care unit of two public hospitals is positively correlated (Figure 1a and Figure 2a). The relationship between safety climate and patient satisfaction was also evaluated. It was found that there was no significant linear relationship between the safety climate and patient satisfaction in the two hospitals (Figure 1b and Figure 2b). The distribution of data shows an increase in the safety climate that does not affect patient satisfaction at inpatient care units. A high safety climate has raised the level of patient satisfaction but the two do not correlate. Furthermore, an evaluation of the relationship between safety climate and job performance in the inpatient care units was carried out, where a positive linear correlation was obtained (Figure 1c and Figure 2c). The final parameter that influences the

service performance being evaluated is the relationship between the safety climate and work productivity. There was a positive linear relationship between the safety climate and work productivity at inpatient care units in two hospitals (Figure 1d and Figure 2d). From these results, it is known that all safety climates have a positive relationship with job satisfaction, job performance and work productivity at inpatient care units in two hospitals, and the safety climate does not correlate with the level of patient satisfaction. Improving safety climate does not directly contributed to the increase of the patients satisfaction.

Safety Climate and Service Performance of Inpatient Care Unit

The relationship between safety climate and service performance at inpatient care services of public hospital has been evaluated based on the contribution of several

parameters such as job satisfaction, patient satisfaction, job performance and work productivity as shown by scatter diagrams in Figure 1 and Figure 2.

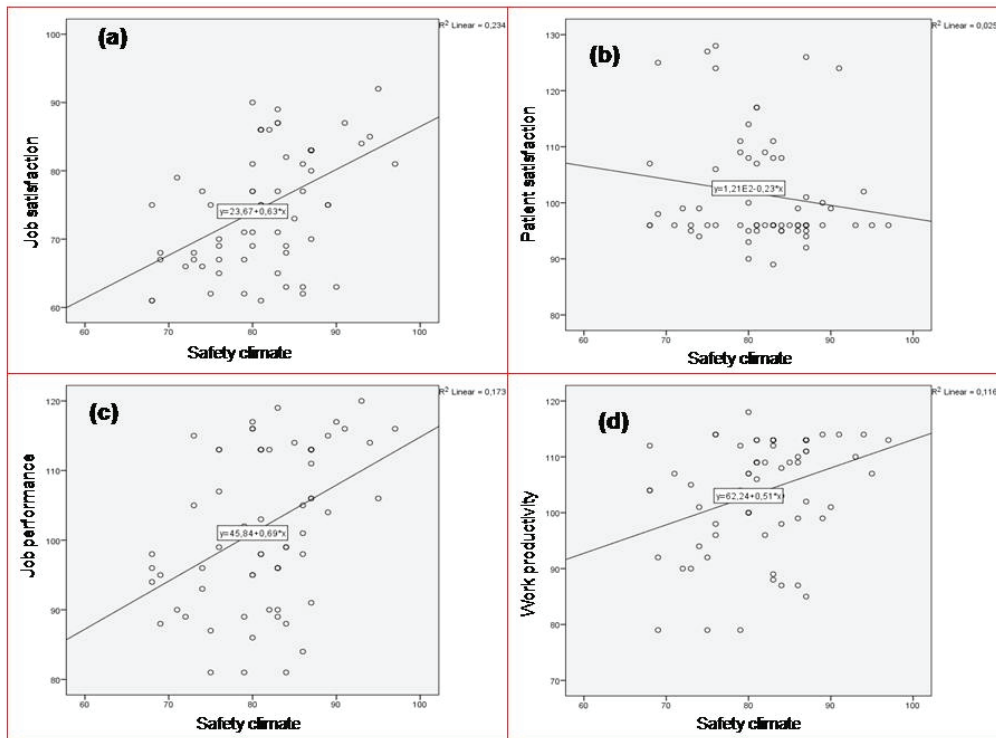


Figure1. Scatter diagram shows the relationship between two variables in Hospital A: (a) Safety climate and job satisfaction, (b) Safety climate and patient satisfaction, (c) Safety climate and job performance, (d) Safety climate and work productivity.

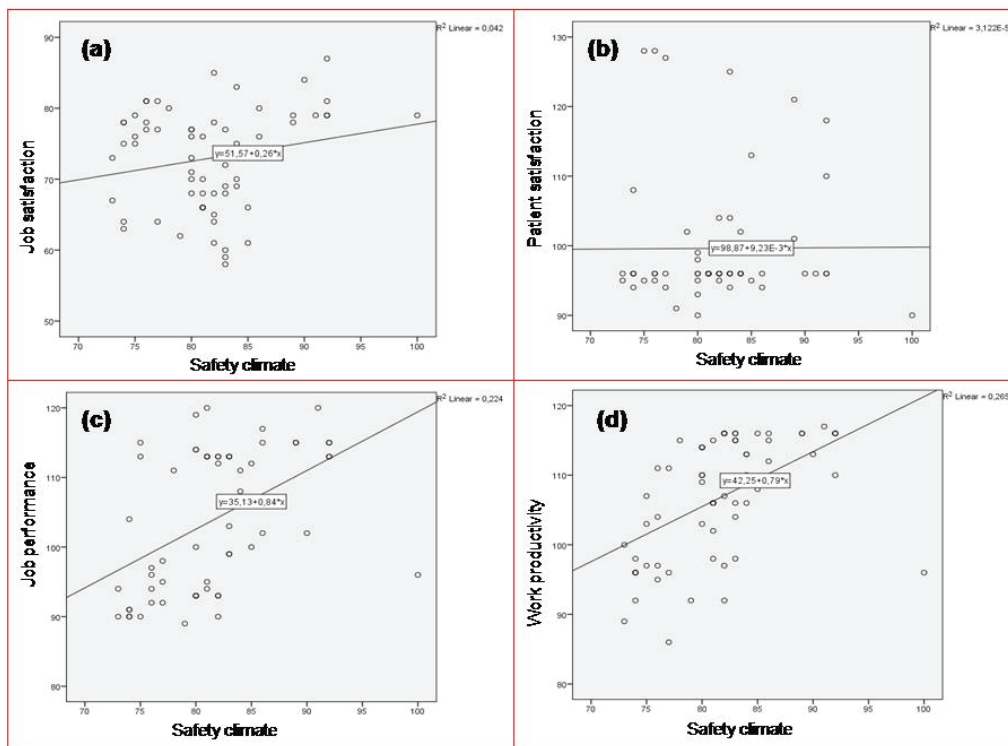


Figure2. Scatter diagram shows the relationship between two variables in Hospital B: (a) Safety climate and job satisfaction, (b) Safety climate and patient satisfaction, (c) Safety climate and job performance, (d) Safety climate and work productivity.

Discussion

In general, the hospitals' performance is assigned to be very good (average 3.25 ± 0.23). Respondents gave very good ratings on all hospital safety climate parameters related to job satisfaction, patient satisfaction, job performance and work productivity. The respondents gave very good opinions on hospital safety climate based on patient satisfaction (average 3.24 ± 0.24). Safety climate that is applied in the hospital is very influential on patient satisfaction because workers show good performance in several parameters such as team work, leadership, communication, staff organization. Service performance based on job satisfaction is categorized good (average 2.88 ± 0.18). A good assessment is given to job satisfaction, especially those related to payroll and incentives, supervision, work conditions, partnerships, security, and opportunities and staff achievements that are applied in hospitals. Hospital safety climate is closely related to job satisfaction of inpatient care unit staff in the hospitals and make a very large contribution to the service performance¹⁴. Good conditions of job satisfaction have resulted from clear job descriptions in the inpatient care unit and the dualism of opinions and orders are always be avoided so that workers can work optimally. Adjustments of the incentives are given according to the working hours and workloads. Supporting facilities available in the hospital environment also improve the welfare of staffs so that the implementation of tasks can run well¹⁵. Work environment arrangements that support tasks in the hospital are also well accommodated. Regular staff training and demonstration of safety practices succeed in increasing employee satisfaction and hospital performance¹⁶.

Safety climate based on the job performance is a key role to service performance. The job performance has been measured, that is seen from the contribution components of work achievement, staff capability, and behavior and work relationships, it is assigned to be very good with an average of 3.43 ± 0.13 . A good work team was created and helped each other in the inpatient care unit at the target public hospitals. Good communication has been established among the workers so that all activities have been carried out periodically and correctly reported¹⁷. Workers always maintain service standards in accordance with a standard safety climate. To create vigilance for workers, warnings are

always given to fellow workers who make procedural errors, especially if there is potential faulty for patient care so as to avoid workplace accidents. In the case of an emergency situation, staff members are given broad freedom to take action, especially in actions related to patient safety, with the aim of avoiding accidents and adverse conditions in patient care¹⁸. Safety climate in two hospitals based on work productivity has also been investigated. The work productivity assessed from the work qualification, motivation, job orientation, maturity of thinking, social skills is classified as very good (average 3.44 ± 0.38). It can be stated that the safety climate and service performance are classified as very good. The staff always works carefully, writing cases and actions taken in handling patients are always done accurately in the journal. Workers always focus on managing patient safety, showing great concern for patients, serving well without discrimination, and trying to optimally meet patient needs. Workers also obey the rules that have been put in place in the inpatient care units, for example maintaining good communication among fellow staff, and between the staff with the patients. With this strategy the safety climate related to job performance has been fulfilled¹⁹. Good communication between the superior and health workers, and also among the fellow health workers will be able to increase their understanding on the importance of safety climate, not only for the patients, but also for the safety of health workers²⁰. Safety climate at inpatient care units is related to safety of work environments because it will support better job satisfaction, supported higher job performance, and resulted in optimum work productivity²¹. Management's commitment in maintaining safety and health will reduce stress on workers so as to create good work productivity²². Safety must become a culture within an organization, which can be obtained from the collective contribution values the of individuals and groups working, including the attitudes, the perceptions, the competencies, behavior patterns, the commitment, and the management^{23,24}.

Conclusions

An evaluation of the safety climate and service performance at inpatient care unit in public hospitals has been carried out well. Service performance obtained from the contribution made by the safety climate with job satisfaction, patient satisfaction, work performance and

work productivity is classified as very good. All safety climate parameters related to patient satisfaction, job performance and work productivity are classified as very good. The safety climate dealing with job satisfaction is classified as good. There are significant positive linear relationship between the safety climate with job satisfaction, job performance and work productivity which can improve the service performance of inpatient care units. However, increasing safety climate in the Inpatient Care Unit does not directly affect the level of patient satisfaction. Safety climate shows a large contribution to the performance of inpatient care units. To improve the safety climate it is recommended that occupational safety and health be discussed regularly. To ensure a high service performance, it is necessary to provide broad opportunities for health workers to attend education and training to adjust to technological advances with the types of services in hospitals.

Conflict of Interest: None

Source of Funding: self funding

Ethical Clearance: Taken from Medical and Health Research Ethics Committee (MHREC) of the Faculty of Medicine, Gadjah Mada University - Dr. Sardjito General Hospital.

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Biosynthesis of Magnetite-Nanoparticles Using Microalgae (Spirulina sp. and Spirogyra sp.)

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Abstract

A promising avenue of research in materials science is to follow the strategies used by Mother-Nature to fabricate ornate hierarchical structures as exemplified by organisms such as diatoms, sponges and magnetotactic micro-algae. This paper focused on bio-synthesized magnetite nano-particles using eco-friendly method. Here, various microalgae have been used such as Spirulina sp. and Spirogyra sp. in order to produce magnetite nano-particles. The iron oxide nano-particles of average size~45 nm were obtained. Further, in this study different characterization technique's applied to obtain the magnetic nano-particles, scanning electron microscopy (SEM), energy dispersive X-Ray spectroscopy (EDX) and fourier-transform infrared spectroscopy(FT-IR). Also, X-ray diffraction, techniques. Calculation to obtaining the crystallite size by Debye-Scherrer equation. Also, The band gap parameters of the magneto-nanooxide such as indirect and direct-band gap energie has been determined ($E_g^{opt} = 1.87\text{eV}$ present sudy and $E_g^{opt} = 4.3\text{eV}$ elsewhere). Finally, the results of this paper clearly indicated that iron oxide-NPs spherical shaped and average size of particle is found to be below 100 nm.

Keyword: Biosynthesis; Magnatite nano-particles; Biofunctionalization; Spyrogyra sp. Surface grafting

Introduction

Nanotechnologies have been known to be used in numerous physical, biological and pharmaceutical applications. Synthesis of nanoparticles that have environmentally acceptable solvent systems and eco-friendly reducing agents is of great importance, such as in textile engineering, biotechnology and bioengineering, water treatment, electronics antibacterial/antifungal agents in a diverse range of consumer products. Spirulina sp. and Spirogyra sp. are nonpathogenic microalgae that are wide word distributed and easy cultured under different growth condition. Spirulina is very high in⁽¹⁾ protein, very low in calories and cholesterol, and high in enzymes, minerals (iron, calcium, sodium and magnesium), and phenolic acids, which have antioxidant properties.

Once materials are prepared in the form of very small particles, they change significantly their physical and chemical properties. In fact in nanodimension,

percentage of surface molecule compare to bulk molecule is high and this enhances the activity of the particle in nano-dimension and therefore, the normal properties of the particle like heat treatment, mass transfer, catalytic activity, etc are all increases. But compare to non-metal nanoparticles, metal nanoparticles have more industrial application. Nanoparticles offer many new developments in the field of biosensors, biomedicine and bio nanotechnology-specifically in the areas- y Drug delivery y as medical diagnostic tools, y as a cancer treatment agent (gold nanoparticles) ⁽²⁾. Nanoparticles and nanostructure are becoming a part in human medical application, including imaging or the delivery of therapeutic drugs to cell, tissues and organs. Drug loaded nanoparticles interact organ and tissues and are taken up by cells. Several studies have shown that the tissue, cell and even cell organelle distribution^{3,4} of drugs may be controlled and improved by their entrapment in colloidal nanomaterials, mainly of the micellar structure, such as nano-container. Magnetic nanoparticles have been

receiving considerable attention because of their wide range of applications, such as the immobilization of the proteins and enzymes, bio-separation, immunoassays, drug delivery, and biosensors. In general, the particle-size distribution in the magnetosome is narrow, whereas a broader-size range in some of the chemical synthesis grown crystals is common⁽³⁾. Finally, there are several important questions about magnetite synthesis that need to be addressed. Magnetic biogenic minerals are produced by microbial activity in a wide range of subsurface environments. Magnetite is usually produced by both Fe^{III} reducing and Fe^{II} oxidizing bacteria, and understanding the formation of biogenic magnetite is particularly important⁽³⁾⁽⁴⁾. Here, we attempt to propose a new method for synthesis magnetic nano-particles from Fe^{II}/Fe^{III} from ferrous salt using divers microalgae (Spirulina sp. and Spirogyra sp.).

Experimental

Materials

Isolation and identification of microalgae

Cultures of microalgae were isolated from Gomaspan dam by spreading water samples collected in October from 5ml depth onto solid 2% agar medium (BG11) as described by⁽⁵⁾⁽⁶⁾. The cultures were incubated at 30°C and illuminated with day- light fluorescent tubes having 2200 lux using plant growth chamber, following the growth of colonies on the agar media. Pure microalgae removed with pasture micropipette, examined under light microscope and identified as described by⁽⁷⁾. After identification the pure colonies were gently blown into liquid medium then incubated at 30 °C and pH 8 to obtain biomass. After 14 days incubation microalgae were harvested by centrifugation at 4000 rpm for 10 min. To determine cell dry weight the collected sample

dried in oven at 70 °C 4-6hrs, and weighted quickly after drying as described by⁽⁸⁾⁽⁹⁾. Furthermore, Iron oxide nanoparticles were synthesized by taking FeCl₂.4H₂O and FeCl₃.6H₂O (2:1 molar ratios) and were dissolved in 50 ml of de-ionized water in a 250ml conical flask and heated at 70°C with mild stirring using magnetic stirrer under atmospheric pressure. Then, after 20 minutes, 25 ml of the aqueous solutions of microalgae (Spirulina sp. and Spirogyra sp.) both has been used in different flasks, was added to the mixture, directly the light yellow color of the prepared microalgae turned to dark-brownish color. Also, After 20 min, 25 ml aqueous solution of NaOH was added to the mixtures with the rate of 2ml/min for allowing the iron oxide settle-down uniformly. Therefore, the mixture let to cool down at room temperature. Finally, the iron-oxide nano-particles were collected by decantation to form magnetite nano-particles. Moreover, the magnetite formed were washed using deionized water then by ethanol and kept in dissector for later use.

Results and Discussions

After purification of microalgae, growing cells were observed under light microscope and photographed. Culture showed the following characters. The filaments were spiral, length (typically 100–150 microns) and with a diameter close to 7-9 microns identified as Spirulina sp. Trichomes Fig.1, It was identified according to⁽³⁾. Fig.2, shows filamentous that appear as green algae, helical or spiral arrangement of the chloroplasts, un-branched filaments and is one cell thick were identified as Spirogyra sp. This alga is characterized by the spiral ribbon-like chloroplasts in the cell. Pheravut and⁽³⁾⁽¹⁰⁾ reported the morphological characteristics of each sample with cell dimensions (width and length), with the number and arrangement of chloroplast spirals/pyrenoids.

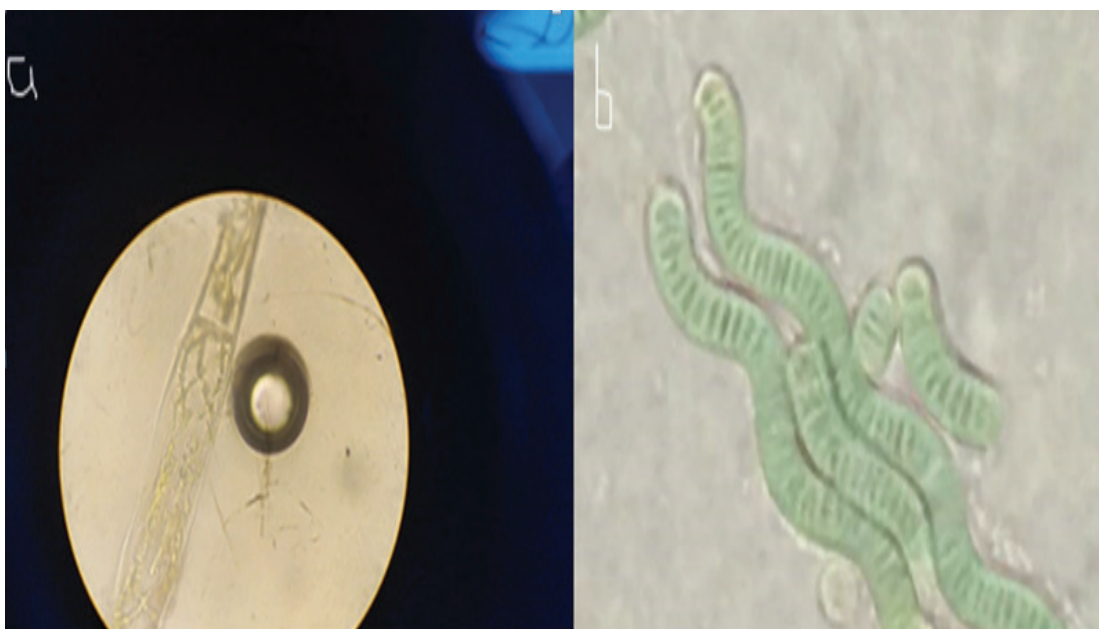


Fig.1. a. Light microscope and photographed of Spirulina sp. Trichomes and b. Spirogyra sp. that appear as green algae, helical or spiral arrangement of the chloroplasts, un-branched filaments and is one cell thick.

The mechanisms of magnetite formation by bacteria/microalgae are still under study and have been examined most intensively. The process by which the magnetosomes are made and organized is not completely known ⁽¹¹⁾. The comparison of the new method in preparation of magnetite with magnetite formation in magnetotactic bacteria is important. It shows how the magnetosomes are formed in bacterial bio-mineralization. The crystalline size, morphology, and particle size distributions of synthetic magnetites compared to the magnetite isolated from magnetotactic bacteria are different. The magnetosome particle sizes typically are from 40 to 130 nm.

Morphology observation

The SEM image of the synthesized magnetite nanoparticles is shown in Fig.2 and 3. It is investigated that the magnetite nano-particles are agglomerated with the spherical-shape and narrow size distributions and grown in large-quantity with average-particle sizes of about 45 nm. However, the presence of agglomeration is clarified in terms of magnetic dipole-interactions between the nano-particles ^{(12), (13), (14)}. On the other hand, the typical EDS spectrum of the synthesis magnetite is observed

in Fig.3. It is good evidence that the synthesized magnetite is formed from Fe^{II}/Fe^{III} and oxygen, only. The concentration of Fe is 57%, whereas oxygen is 29%. Except Fe and O, also some carbon detected peak that related with cell wall of the microbial in the spectrum ⁽¹⁵⁾.

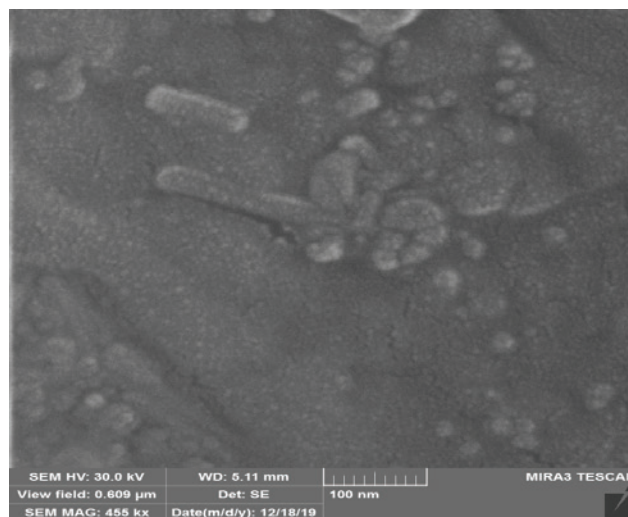


Fig.2. Field emission scanning electron microscope for narrow distribution of bio-synthesized nano-particles

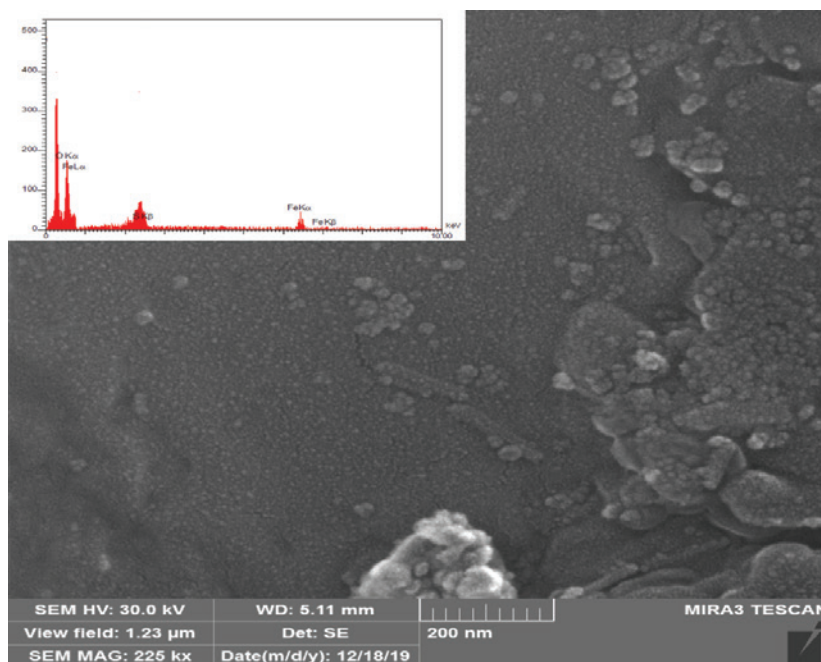


Fig.3. Field emission scanning electron microscope with EDX at different magnifications

FT-IR characterization

The FT-IR of pure Spirulina algae as shown in the Fig.4.a, where the vibrations at $3500\text{-}3560\text{cm}^{-1}$ were attributed to the OH stretching of amino acids and carbohydrates additionally of the presence of alcohols and phenols⁽¹⁶⁾. In the range of $3500\text{-}3300\text{cm}^{-1}$ the N-H stretching vibration of the secondary amines corresponded to the lipids and protein were noticed while from $3000\text{ to }2850\text{cm}^{-1}$ the aliquot C-H stretching vibration of the alkenes. Moreover, the frequency ranges $3300\text{-}2500\text{cm}^{-1}$ represent the presence of the aliphatic

OH stretching vibration of the carboxylic falls. With respect to the signals of $2260\text{-}2100\text{cm}^{-1}$ was assigned to the triple bond C-C of the alkynes⁽¹⁷⁾. The vibration of the carbonyl group C=O was located between $1750\text{-}1735\text{cm}^{-1}$. From $1680\text{-}1640\text{cm}^{-1}$ corresponding to the stretching vibration of the C=C bond while the N-H flection of the ketone appeared between $1650\text{-}1580\text{cm}^{-1}$ and the flection of the CH_2 group was showed between $1435\text{-}1405\text{cm}^{-1}$, respectively⁽¹⁶⁾⁽¹⁸⁾. The range of $1550\text{ to }1475\text{cm}^{-1}$ was observed asymmetric stretching N-O corresponding to the nitrogenous compounds of the alga⁽¹⁹⁾.

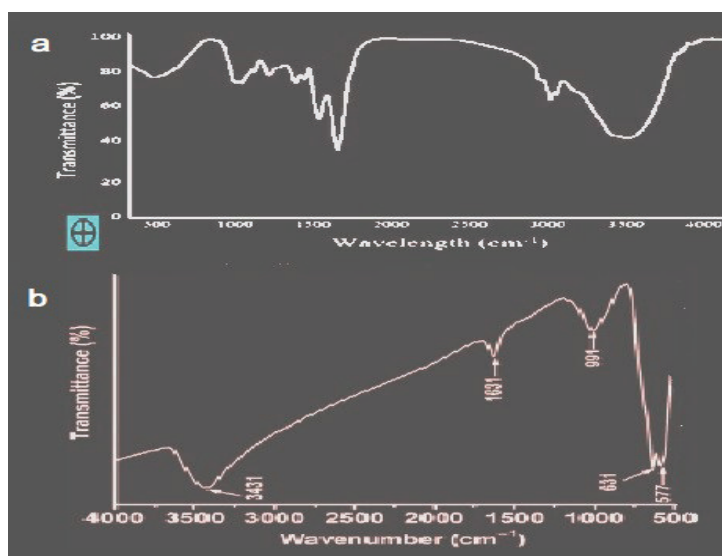


Fig.4. Spectrum of FTIR (a) the Spirulina sp. dried cell and (b) Iron oxide-MNPs synthesized

Fig.4.b, clearly indicated that the iron oxide nanoparticles has been successfully biosynthesized, as the characterization of FT-IR showed that the exhibition of the typical spectrum of FT-IR which demonstrated divers well explained peaks at 577, 631, 991, 1631 and 3431 cm^{-1} . The presented of two peaks at 577 and 631 cm^{-1} are due to the presence of iron–oxygen FeO which indicated that the synthesized nanoparticles are iron-oxide ⁽²⁰⁾. In addition, the presented of a small peak at 991 is due to the appearance of NO₃ group. Furthermore, the peaks positioned at 1631 cm^{-1} and 3431 cm^{-1} are due to the absorbed vibration of H₂O and surface-hydroxyl and Hydroxide stretching mode, respectively.

Nevertheless, Spherical iron nanoparticles synthesized within biological microalgae (*Spirulina* sp.) acted as a catalyst for cross coupling reaction. Also, Bio-NPs have also been reported to synthesize directly on alginic acid and seaweed (*Laminaria digitata*, a brown alga with the common name Oarweed).

Phase analysis

In order to characterized the phase identification and crystalline structures of the synthesized nanoparticles, x-ray powder diffraction was used. The latter in one of the most significant usage of this technique. The x-ray diffraction (XRD) was conducted using x-ray diffractometer⁽¹⁶⁾. Fig 8 shows XRD-spectra of biosyn-Fe₃O₄ and the particle size of the synthesized nano-oxide was determined using Debye-Scherrer equation according to;

$$L = \frac{K\lambda}{\beta \cos \theta} \tag{Eq.1}$$

Additionally, the crystallite mean-diameter resulted from the diffractogram by using the above formula is 45 nm, which confirms the size observed by the electron micrographs above. Finally, the high intensity of these peaks confirmed strong scattering of the X-ray in the crystalline phase⁽¹⁸⁾.

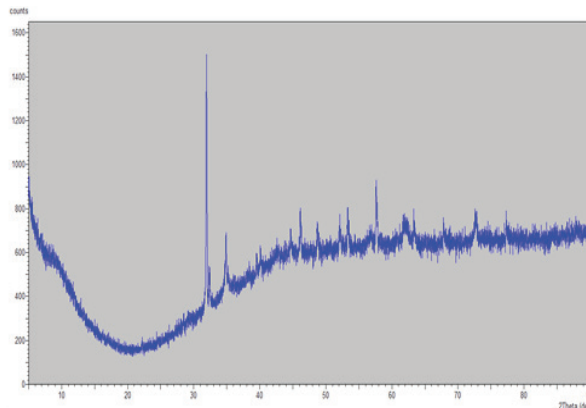


Fig. 5. XRD-patterns of the magnetite nano-oxide

Spectroscopy measurement of Biosyn-Fe₃O₄

Fig.6 shows the optical absorption (A) of Biosyn-Fe₃O₄ which is measured in a scanning range of wavelength from 190 to 1000nm, with scan interval of 0.2nm. On the other hand, the optical absorption obtained, it is possible to determine each of optical energy band gaps of indirect and direct transition occurring in band gap, Urbach energy and Fermi energy as following:

Designation of band gap (Indirect and Direct transition) of iron-oxideNPs

Davis and Mott, gave an expression for the absorption coefficient, $\alpha(\nu)$, as a function of photon energy ($h\nu$) for indirect and direct transition through the following Eq.

$$A = -\ln\left(\frac{I}{I_0}\right) = \alpha(V)L \tag{Eq. 2}$$

$$\alpha(\nu) = \frac{A}{L} \tag{Eq. 3}$$

$$\alpha(\nu) = \frac{\alpha_0 (h\nu - E_g^{opt})^n}{h\nu} \tag{Eq. 4}$$

where A is the absorption, I is intensity of transmitted light, I₀ is intensity of incident light, α(v) is the absorption coefficient of the sample, L is the thickness of the cell, α₀ is constant related to the extent of the band tailing, opt Eg is optical band gap energy and the exponent, n=2 for allowed indirect transition. In addition, by plotting (hvα)^{1/2} and (hvα)² as a function of photon energy (hv), the optical energy band gap for indirect opt Eg₂ transition can be determined. Consequently, the respective values of opt Eg are obtained by extrapolating to (hvα)^{1/2}=0 for indirect transition as shown in Fig. 6⁽⁵⁾⁽⁹⁾.

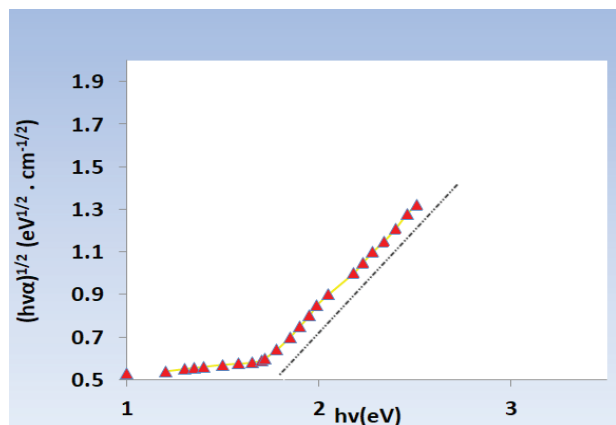


Fig. 6. Indirect optical energy-band gap

Furthermore, the B_g energy of the NPs are inversely proportioned to its size. By this evidence, it is quite easy to say that the bandgap energy of NPs can be controlled by controlling their sizes. On the base of the value of indirect energy bandgap for the magnetite sample are classified this sample as a semiconductor, semiconductor energy band gap (0 - 3 eV)⁽²¹⁾.

Conclusion

It is reasonable to say that the concern to magnetite-NPs with magnetic properties rapidly developed every year. These materials have found their characterization and their applications in medicine for treatment and diagnostics of serious diseases, where treatment by other methods is more durable and expensive. Moreover, synthesis of such nanomaterials with stable properties is not completely elaborated, since besides the size-factor, the character of their building micro-geometry, methods of identification and functional properties must be examined. Additionally, special attention should be paid to topography, biocompatibility of initial nanoparticles and sizes. On the other hand, just these parameters eventually determine the functional properties. In accordance with results of this work it's clearly shown

that identification of synthesized nanoparticles can be realized most effectively by the change of their magnetic properties. This is possible both, at the stage of their synthesis and after bio-functionalization.

Ethical Clearance- None

Source of Funding- Self

Conflict of Interest- Nil

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Bacterial Contamination of Kitchen Sponges and Cutting Surfaces and Disinfection Procedures

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Abstract

Background: The most common of bacterium in kitchen sponges and cutting surfaces which can play a task within the cross-contamination of foods, fomites and hands by foodborne pathogens.

Aims and Objectives: This study investigated the incidence of bacterium in kitchen Sponge, and cutting surfaces.

Material and Methods: a complete of twenty four kitchen Sponges were collected from home kitchens and therefore the numbers of mesotrophic microorganism, coliform microorganism, E. coli, Salmonella, genus {pseudomonas|bacteria genus} and staphylococci in every kitchen Sponges were determined. Microbiological tests of all sponges for total mesophilic aerobic microorganism, S. aureus, Pseudomonas, Salmonella spp., and E. coli were performed on days 3, 7, and 14 by sampling. The sponges involved in daily use in kitchens countenously with the dishwasher detergent a minimum of doubly daily

Results: Results from the overall mesophilic aerobic microorganism, indicate a major increase within the variety of log CFU/ml. the amount of E. coli was reduced, Salmonella spp. was stabled, S. aureus was enhanced from the sponges throughout fourteen days. Genus Pseudomonas was enhanced and was the dominant micro flora within the sponges throughout fourteen days.

The sponges had MPN of 9.9 log CFU/ sponge, among the analyzed sponges, 8.2, 6.5, and 5.5 log CFU/ sponge wherever found to E. coli, Salmonella and S. aureus severally.

The boiling technique was the foremost effective in inactivating microorganisms and able to cut back the overall counts by 9.9 – 4.7 log CFU/sponge (50 %), whereas the disinfection by hypochlorite two hundred ppm reduced the overall counts by 9.9-6.8 log CFU/sponge (31 %). the typical reductions of CF (E. coli) - once boiling and hypochlorite disinfection- were 2.1 log CFU/ sponge (74 %) and 4.2 log CFU/sponge (50 %), severally, while 4.2 log CFU/sponge survived once hypochlorite disinfection.

There was a reduction of approximately 65-75% of all groups growth rate was to stainless steel surface, 31-68% to polyethylene surfaces and 17- 31 % to wooden surface. Stainless steel was the best surface to prevent bacterial contamination and survival of cutting boards using in kitchens.

Keywords: Kitchen Sponges; Microbiological Contamination; Disinfection; cutting surface; Cross-Contamination

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Introduction

Most of homes and workers are using sponges in cleaning food equipments and plates in kitchens.

Sponges may contain or to get rid of all food residues, which may consider as suitable environments for microbes (Redmon & Griffith, 2003).

Kitchen sponges are continuously used in the unit as a result of they'll stay wet and being nearly as good environments allowed all foodborne pathogens.

Contaminated Kitchen sponges accustomed wash dishes containing foodborne pathogens transferred *Escherichia coli* to surfaces a lot of of times than enter bacteria spp. (Mattick et al., 2003). Sponges contaminated with *staph aureus*, *salmonella*, and *Campylobacter jejuni* were ready to transfer pathogens to chrome steel surfaces, where *S. aureus* survived for up to four days. Similarly, pathogens transferred by sponges to chrome steel surfaces were later transferred to chop vegetables at variable rates (Kusumaningrum, et al 2003). It was found that throughout analysis, 10 kitchens within the United States of America, thirty third and sixty seven of sponges tested positive for *E. coli* and soiled coliforms (Josephson, Rubino, & Pepper, 1997).

Many studies have shown a the effects of sponges to spread pathogens is crucial to food safety due to the presence of those pathogens in unit kitchens for both gram positive and negative bacteria (Beumer & Kusumaningrum, 2003).

It was demonstrated that Cross-contamination is one of the most important factors of food-borne illness outbreaks (Greig and Ravel (2009), (Chen et al (2001). cross-contamination is commonly related to contamination of dishes or surfaces with laundry water, contaminated sponges, or contaminated things placed connected with them.

sponges may be necessary disseminators of pathogens and might be a reason of transferring microorganism to surfaces and utensils, that inflicting the contamination of food (Josephson et al (1997), Kusumaningrum et al (2003), Mattick et al (2003).

Also one of the most important equipments kitchens are stainless-steel, wood and polythene. However, the surfaces of those materials are irregular once discovered microscopically, therefore facilitating the deposition of organic matter and food residues, and contributory to microorganism attachment and survival (Sinde and Carballo (2000), (Kusumaningrum et al (2003).

The main objective of this study was:

- **To evaluate the microorganism contamination in kitchens sponge.**
- **Test the potential of disinfection methods in the survival of microorganisms in surfaces of stainless-steel, wood and polythene.**

Material and Method

Total of twenty four sponges (119 millimeter nine seventy six mm nine fifteen mm) were purchased at an area grocery store; were collected from four home kitchens (i.e., three sponges were collected from every kitchen (four groups).

Enumeration of total Mesophilic Aerobic bacterium, Staphylococci, *Pseudomonas* bacteria genus}, *Salmonella*, total coliforms and *E. coli* on used kitchen sponges.

Kitchen sponge was analyzed for the presence of total mesophilic aerobic bacterium, staphylococci, *Pseudomonas*, *Salmonella*, *E. coli* (Lancette and Tatini, 1992). Sponges were hold on at temperature (20-25 oC, 42± % humidity) all sponges were used for 0,3,7 and 14 days.

The sampled sponges were collected by sterile latex gloves, placed within sterile plastic luggage, and transported at temperatures < 5°C to the Microbiological analysis and Diagnostic Laboratory.

(Rossi et al.2013).

Transfer and survival of heterotrophic microorganisms on surfaces of stainless steel, wooden and polyethylene

Sponges were totally rubbed 5 times on each stainless-steel, plastic and wooden cutting boards surface in order to make sure that all surfaces are fully contaminated.

The sponges were divided into four groups for this experiment. the (group 1) was composed of sponges contaminated with total MNP CFU/cm² and therefore the second group (group 2) was composed of sponges contaminated with *E. coli* log CFU / sponge. The third cluster (group 3) was composed of sponges contaminated with enterobacteria log CFU/cm². The (group 4) was composed of sponges contaminated **with staph log CFU/cm².**

All cutting boards were left for at least 18 hours at room temperature, swabs were taken from each surface into agar plates and incubated at 36 °C for 48 hours, and microbial growth and count were expressed as CFU

Surviving rate= $NF/NS \times 100\%$, where NF= CFU from sponge and NS= CFU on surface by contact plate (Rossi et al. 2013).

Results and Discussions

Total mesophilic microorganisms were investigated in all sampled sponges (Table 1).

Table 1 indicated a major increase within the variety of log CFU/ml. the amount of *E. coli* was small, whereas *Salmonella* spp spp. was stabled, *S. aureus* was redoubled from the sponges throughout fourteen days. true bacteria was redoubled and was the dominant microflora within the sponges throughout fourteen days (Table 1).

The Cross contamination inside adequate storage or change of state was involved in several instances that is **and faecal coliforms on used kitchen sponges.**

taken into account as a main frequency reason for illness (Olsen et al., 2000). In other studies, Dishcloths and sponges were found as a possible supply for spreading pathogenic microorganisms (Josephson et al., 1997).

The results showed that wet environments on all kitchen surfaces, were the most reason of contamination and also the incidence of doubtless harmful species. Conjointly it absolutely was found that dishcloths and similar improvement utensils, to be oft and heavily contaminated.

Data from this analysis also counsel that, raw food within the kitchen is perhaps the most supply of contamination, the sink, waste lure and close areas can even act as semi-permanent sources or reservoirs that harbor and encourage the growth of microorganism.

Table 1: Enumeration of total mesophilic aerobic bacteria, staphylococci, *Pseudomonas*, *Salmonella*,

Sponge	Microor-ganism	Day3	Day7	Day10
1	Mesophilic aerobic bacteria CFU/ sponge	5.8	6.2	6.8
2		6.2	8.2	9.1
3		5.6	6.2	8.3
4		5.1	7.0	8.8

Bacteria	Log CFU/ml			
	n	Day3	Day7	Day14
<i>Pseudomonas</i>	4	3.2	4.8	6.1
<i>Salmonella</i>	4	4.8	4.9	5.0
<i>E. coli</i>	4	6.8	5.8	5.7
<i>S. aureus</i>	4	0.3	0.8	0.9

Cross-contamination is taken into account because the most risk throughout regular domestic cleansing since sponges were found to be potential source of pathogens in kitchens (Hilton and state capital, 2000) and in step with the results all pathogens and bacterium were able to survive in sponges for a minimum of for seven days (Kusumaningrum et al., 2002).

Research by (Kusumaningrum et al., 2002; Hilton and state capital, 2000) recommend that almost microorganism activities in sponges depends on many factors, bacterium range and concentration are increasing quickly underneath the favorable conditions during a used sponge.

The sponges had CFU 9.9 log CFU/ sponge, among the analyzed sponges, 8.2, 6.5, and 5.5 log CFU/sponge wherever found to *E. coli*, *Salmonella*, and *S. aureus* severally (Table1).

Similar results were found by other researchers, Kusumaningrum et al.2002, United Nations agency determined about 6 log CFU/sponge in sponges used for 3 days in kitchens within the European nation. Also, Erdogru & Erbilir found 6.9 log CFU/sponge in sponges used for ten days.

Table 2: Bacteria reduction by disinfection methods sponge in collected sponge (log/ CFU/ml).

Log CFU/ml			
Bacteria	Not disinfected	Disinfected by boiling	200 ppm sodium hypochlorite
Total	9.9	4.7	6.8
<i>E. coli</i>	8.2	2.1	4.2
<i>Salmonella</i>	6.5	3.2	4.3
<i>S. aureus</i>	5.5	1.2	1.1

Disinfection Procedures

The disinfection methods employed in the study were found to be effective in reducing the count of bacteria; it was incontestable that boiling was the most effective disinfection methods. it had been ready to cut back the whole microorganism counts by 9.9 – 4.7 log CFU/sponge, almost as (50 %), whereas the medical care blanching agent 200 ppm reduced the whole counts by 9.9-6.8 log CFU/sponge (31 %).

The average reductions of CF (*E. coli*) -after boiling and blanching agent disinfection- were 2.1 log CFU/ml (74 %) and 4.2 log CFU/ml (50 %), severally, while 4.2 log CFU/ml survived when blanching agent disinfection methods Table 2).

Sharma et al.2009, was found a big reductions of the microorganism activities when exploitation disinfection methods with a 10% of blanching agent for 3 minutes, whereas boiling in an exceedingly kitchen appliance for one minute, that found to possess a higher result scrutiny to the blanching agent treatment.

Some microorganisms could survive the boiling; this method will eliminate solely half or variety of the microorganism population. It had been additionally found that microwave boiling was more practical than typical boiling for the inactivation of *Bacillus subtilis*.

The mechanism that will justify the potency of the boiling technique that, the hot temperature of the water that is ready to denature proteins and, consequently, destroy the semipermeable membrane integrity, inflicting the death of microorganisms.

Additionally, another necessary issue to be stressed is that in water boiling treatment, the sponge moves around among the liquid, creating the removal of a good deal of organic matter doable and, with that, higher heat penetration (Rossi et al 2012).

In several studies, it had been attainable to conclude that kitchen sponges will be expressively contaminated; however there are effective strategies for disinfection in the present study significantly reduced the bacterial counts, boiling was more effective than disinfection in 200 ppm sodium hypochlorite these results showed the adequacy of the boiling methodology. (Rossi et al 2012, Sharma et al.2009).

Transfer and survival of heterotrophic microorganisms on surfaces of stainless steel, wooden and plastic cutting board.

Large variation of contamination was found among results, that the sponges were divided into four groups for this experiment. the (group 1) was composed of sponges contaminated with total MNP CFU/cm² and therefore the second group (group 2) was composed of sponges contaminated with *E. coli* log CFU / sponge.

The (group 3) was composed of sponges contaminated with enterobacteria log CFU/cm². The fourth cluster (group 4) was composed of sponges contaminated with staph log CFU/cm²

(Table3). Table 3: Surviving rate of bacteria from sponge to stainless steel, wooden and plastic surface Contaminated with bacteria

Organism	Log CFU/cm ²						
	CFU	Wood	Rate %	Plastic	Rate%	Stainless steel	Rate%
Total	9.2	7.6	83	4.8	52	3.2	35
E. coli	6.6	4.8	73	3.0	45	2.3	35
Salmonella	6.2	4.9	79	4.3	69	2.0	32
S. aureus	3.2	2.2	69	1.2	38	0.8	25

The transferred of microorganisms (time zero in table 3) was terribly high by sponges from all groups. Group one sponges transferred a median of 9.2 log CFU/cm² of the initial contamination, 3.2 log CFU/cm² to stainless steel surfaces and 4.8 log CFU/cm² to plastic surfaces, and 7.6 log CFU/cm² to wood surface. Whereas group of (E. coli) sponges transferred a median of 2.3 log CFU/cm² and 3.0 log CFU/cm² and 4.8 log CFU/cm² to the surfaces of stainless steel and plastic, and wood surface respectively (Table3).

There was a reduction of roughly 65-75% of all groups rate to stainless steel surface, 31-68% to plastic surfaces and 17- 31 % to wood surface. Stainless steel was best surface to stop microorganism contamination and safe cutting boards in kitchens (Table3).

The results of the current study demonstrate that the sponges utilized in kitchens could also be contaminated by microorganisms, this was similar and corroborates with many previous studies (Josephson et al (1997), Erdogru and Erbilir (2005), Hilton and state capital (2000), Kusumaningrum et al (2002). for instance, the counts of pathogenic CF which were the same as the results bestowed by Kusumaningrum et al. (2003) and Josephson and colleagues (1997)).

The presence of CF in kitchen sponges is worrying as a result of it reflects inadequate healthful conditions. Such contamination in sponges could come back from raw or boiled contaminated food, inadequate sanitary practices throughout food preparation, absence of disinfection procedures, cross-contamination because of contaminated surfaces, and storage in places wherever there's wetness and high temperatures when contamination, creating potential microorganism multiplication (Keeratipibul et al (2009), siimilar with the study of Mattick et al (2003), kitchen sponges will be contaminated throughout cleaning dishes contaminated with microorganisms which will be transferred to surfaces.(Kusumaningrum et al.2002).

There is a very important and constant risk of contamination transfer from the used surfaces; disposable sponges ought to be thought-about to be used whenever potential. As recommendation for Reusable sponges, sponges ought to be dried when use or immersed in boiling water for five min, a good means that of removing.

In this study, the risk has been thought-about to be down once the surfaces are dry, partially as a result of microorganism growth and survival would be reduced

by using stainless and plastic cutting board.

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Clinical and Radiodensitometric Evaluation of Ozonated Olive Oil in the Management of Periodontal Condition in Smoker Patients

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Abstract

Background and Objective: This study was designed to evaluate clinically and radiographically the role of Ozonated olive oil in the management of periodontal status in smoking patients.

Materials and Method: The study was performed on twenty four medically free patients having chronic periodontitis. Radiographic bone density evaluation as well as linear alveolar bone level and clinical periodontal parameters were recorded after the initial phase of plaque control then, the patients were instructed to perform oral hygiene measures. The clinical parameters which were included are; plaque index, gingival index, probing depth and clinical attachment loss. The patients were divided into 2 main groups, the first group received Ozonated olive oil while the second group served as control group. At baseline, three and six months, bone density and alveolar bone level were radiographically recorded using CBCT. The statistical analysis of the collected clinical and radiographic data revealed an overall clinical as well as Radiometric and Densitometric measurements improvement by time for the Ozonated olive oil group in comparison to the control group at baseline, three and six months.

Results: Ozonated olive oil group showed significant difference regarding the control group.

Conclusion: The results of the current study revealed that the use of Ozonated olive oil can enhance bone level and density as well as tissue healing in periodontially affected teeth. In addition, the use of CBCT is considered as an effective method for evaluation of preoperative and postoperative alveolar bone.

Keywords: Ozonated olive oil, Periodontal condition, Smoker Patients

Introduction

Periodontium refers to the function unit of the tissues supporting the teeth this term includes the gingiva, dento-gingival junction, periodontal ligament, cementum and the alveolar process .It serves as the supporting apparatus for the teeth in function and in occlusal relationships ⁽¹⁾.

Periodontal disease is a common infection and represents one of the most prevalent public health problems where it results in loss of connective tissue attachment, reduced alveolar bone levels, increased pocket depth and gingival recession any inherited or acquired disorder of the tissues surrounding and supporting the teeth (periodontium) can be defined as a periodontal disease. These diseases may be of developmental, inflammatory, traumatic, neoplastic, genetic or metabolic origin ⁽²⁾.

One of the largest studies of risk factors for periodontal disease was that undertaken in Erie County,

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New York State. Involving 1361 subjects aged 25 to 74 years, this study showed that those who smoked were at greater risk for experiencing severe bone loss than those who did not smoke, with odds ratios ranging from 3.25 to 7.28 for light and heavy smokers, respectively (3).

Ozone therapy has successfully being used for more than 100 years in the medical field for treatment of various diseases; it presents several properties that can be useful in medical fields. Ozonated oils are mixture of ozone and different vegetable oils such as olive and sunflower that used as antiseptic for oral application of wounds, gingivitis and herpes simplex. Ozone is used in dentistry as gaseous, Ozonated water and Ozonated oils.(4)

Ozonated (ozonized) olive oil is prepared by bubbling ozone-oxygen gas through pure olive oil until it solidifies. In European countries the Ozonated olive oil has been applied topically to a variety of cutaneous diseases for disinfecting the lesions and promoting their healing, though little attention has been paid to the therapy with Ozonated olive oil in Japan, we have recently demonstrated that the Ozonated oil is beneficial to the patients with intractable fistulae or wounds. For the medical use of the Ozonated olive oil, its quality standardization is of great Importance (5).

The success of periodontal therapy depends on many factors. One of the most important factors is the accurate imaging of the morphology of periodontal bone destruction to establish the treatment plan. Radiographs are therefore necessary to determine the extent and severity of the periodontal lesions. (6)

Upon comparing clinical periodontal probing and 2D intraoral radiography, 3D CBCT scanning was found to be more effective in assessing periodontal structures. CBCT is as accurate as direct measurements using a periodontal probe and as reliable as intraoral radiographs for interproximal areas.(7)

The presented study was designed to evaluate clinically and radiographically the role of Ozonated olive oil in the management of periodontal status in smoking patients.

Materials and Method

I-Patient selection:

The present study was designed as a controlled clinical trial. The number of the study population consisted of 24 young adult smoker patients .

II-Patient Grouping:

- **Group (1):** Comprised 12 patients where Ozonated olive oil was applied to first molar area of the mandible.

- **Group (2):** Comprised 12 patients as a control group.

III-Pre-treatment Patient evaluation:

1. Clinical Evaluation:

For every patient, a detailed history was taken; including present and past medical and dental status. The periodontal status of all cases was assessed according to the following parameters:

A-Plaque index: According to (Silness and loe 1964) (8) the criteria for the plaque index system were

- 0. No plaque in the gingival area.
- 1. Film of plaque adherent to free gingival margin and the adjacent area of tooth. The Plaque may only be recognized by running a probe across the root surface.
- 2. Moderate accumulation of soft deposits within the gingival pocket, on the gingival margin and or adjacent tooth surface which can be seen by the naked eye.
- 3. Abundance of soft matter within gingival pocket and or on the gingival margin and adjacent tooth surface.

B- Gingival index: According to (Silness and loe 1964) (8) the criteria for the gingival index system was:

- 0. Normal gingival
- 1. Mild inflammation: slight change in color, slight edema and no bleeding on probing.
- 2. Moderate inflammation: redness, edema and glazing and bleeding on probing.
- 3. Sever inflammation: marked redness and

edema, ulceration and tendency for spontaneous bleeding.

C- Probing pocket depth: Measured from the free gingival margin to the base of the pocket depth using William graduated periodontal probe.

D- Attachment loss: Measured by subtraction of the distance between gingival margin and cemento-enamel junction (GM-CEJ) from recorded probing depth, or in case of gingival recession adding (GM-CEJ) value to the probing depth measurements, all measurements were carried out using William's graduated probe.

1. Radiographic Evaluation:

CBCT Examination:

Each case under investigation was scanned radiographically using CBCT (Scanora 3DX**) machine with CMOS flat panel detector and isotropic voxel size of 133 µm using field of view(8×10cm) and high definition mode with exposure parameters of ; 90 Kvp ,10 m.A ,exposure time 10s,effective exposure time 6 s, and 0.5mm focal spot.

The patients were instructed not to move during exposure. The primary reconstruction time was about 2 minutes which was automatically carried out after acquisition. Images were acquired and saved as DICOM format. Secondary reconstruction was conducted using OnDemand3D software.

IV- Treatment phase:

v Base line treatment:

- All patients received bilateral periodontal therapy (scaling and root planning treatment).

Ozonated olive oil (OOO) application:

Patients in group (1) received (LIL) as follows:

Ozonated olive oil was applied in the deepest selected periodontal pocket using disposable 10 ml plastic syringe. The selected teeth were isolated carefully with cotton rolls and thoroughly dried and the gel was applied carefully subgingivally and interproximally until excess oil was observed from the gingival margin. This procedure was repeated for all teeth under treatment Ozonated olive oil application was performed

immediately after initial and at 7, 14 and 21 days after periodontal therapy. Excess oil was removed with a cotton roll and patients were instructed not to eat, drink, or rinse for at least 30 min. (9)

V- Patient follow-up and post-treatment evaluation:

-Patients were clinically and radiographically followed up after 3 and 6 months, where all clinical parameters (plaque index, gingival index, probing pocket depth and attachment loss) and radiographic linear (radiometric) and densitometric measurements were recorded and used for treatment evaluation.

Radiographic measurements

-Radiodensitometric analysis:

Regarding the bone density, it was calculated using OnDemand software (10) where the mean pixel gray scale values of serial ROIs (region of interest) were analyzed to determine whether changes in radio densities have occurred or not (10).

As an attempt to assess the bone density changes around each surface of the studied teeth (first mandibular molar) a ROI was chosen just tangential to the lamina dura on the mesial, distal, buccal or lingual sides according to the site of the bone loss. This ROI was assessed radiodensitometrically as a rectangular area of fixed dimension (figure 1). The mean of the area measurement was pooled and included into further statistical analysis during each of the follow up periods.

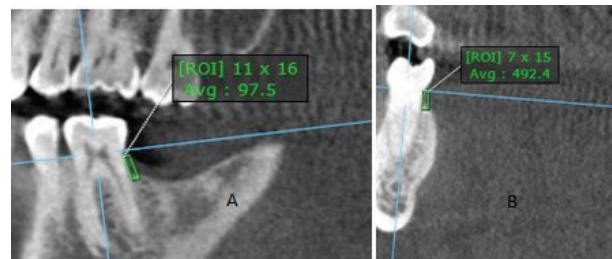


Figure (1):

(A) (B)

Figure(1)(A) Sagittal Densitometric measurements&

(B) Coronal Densitometric measurement

Radiometric (Linear) analysis:

Similarly, the marginal bone loss was measured for all patients immediately post operative, 3 and 6

months, to assess changes in the crestal bone level along the follow up periods in both groups. The bone level was measured from the sagittal view by drawing a line perpendicular to the CEJ, then a parallel line was created along which the distance extending from the CEJ to the deepest part of the bony defect was calculated.(figure 2)

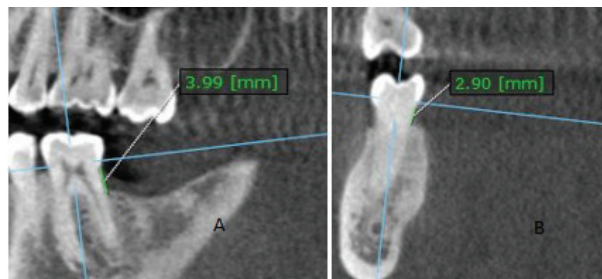


Figure (2):

Figure (2) (A) Sagittal linear measurements&

(B) Coronal linear measurements

Statistical analysis:

The mean and standard deviation values were calculated for each group in each test. Data were explored for normality using Kolmogorov-Smirnov and Shapiro-Wilk tests, data showed non-parametric (not-normal) distribution. Mann Whitney test was used to compare between two groups in non-related samples (Groups). Friedman test was used to compare between

more than two groups in related samples (Time periods). The significance level was set at $P \leq 0.05$. Statistical analysis was performed with IBM® SPSS® Statistics Version 20 for Windows.

Results

The obtained data were recorded, tabulated and subjected to statistical analysis.

I) Clinical Results:

There was no statistical significant difference between the Ozonated olive oil group and the Control group through each follow-up period and the following one. (Baseline), (After 3months) and (After 6 months) regarding the Plaque index, Gingival index, probing depth and clinical attachment loss.

II) Radiographic results:

1) Densitometric measurements

Table 1 summarizes the percentage change (increase) in alveolar bone density values through the different follow-up intervals in the Ozonated olive oil group and the control group, and compares between both groups at the different follow-up periods. (TABLE 1)

Table (1): Comparison between Ozonated olive oil and control groups regarding the percentage of change in density measurements at different follow-up periods:

Variables	Density measurements						
	Pre-3m		Pre-6m		3m-6m		p-value
	Mean	SD	Mean	SD	Mean	SD	
Ozonated olive oil	6.05%	4.78	11.12%	9.72	4.65%	5.35	0.001*
Control	1.00%	3.40	1.60%	4.39	0.58%	1.92	0.700ns
p-value	0.008*		0.006*		0.034*		

*; significant ($p < 0.05$) ns; non-significant ($p > 0.05$)

Ozonated olive oil group:

($p=0.0700$).

There was a statistically significant difference between (Pre-3m), (3m-6m) and (Pre-6m) groups where ($p=0.001$), in addition, a statistically significant difference was found between (Pre-6m) and each of (Pre-3m) and (3m-6m) groups where ($p=0.002$) and ($p=0.028$). However, no statistically significant difference was found between (Pre-3m) and (3m-6m) groups where ($p=0.754$).

Control group:

There was no statistically significant difference between (Pre-3m), (3m-6m) and (Pre-6m) groups where

Upon comparing both groups, a statistically significant difference was found between them at each follow up interval.

2-Linear Measurements

Table 2 summarizes the percentage change in linear measurements (decrease) through the different follow-up intervals in the Ozonated olive oil group and the control group, and compares between both groups at the different follow-up periods.

Table 2: Comparison between Ozonated olive oil and control groups regarding the percentage of change in linear measurements at different follow-up periods:

Variables	Linear measurements						p-value
	Pre-3m		Pre-6m		3m-6m		
	Mean	SD	Mean	SD	Mean	SD	
Ozonated olive oil	6.13%	4.37	13.50%	7.21	6.93%	5.09	<0.001*
Control	0.07%	2.04	0.78%	5.71	0.88%	5.80	0.093ns
p-value	0.010*		0.004*		0.019*		

*; significant ($p<0.05$) ns; non-significant ($p>0.05$)

a) Ozonated olive oil group:

There was a statistically significant difference between (Pre-3m), (3m-6m) and (Pre-6m) groups where ($p<0.001$), in addition, a statistically significant difference was found between (Pre-6m) and each of (Pre-3m) and (3m-6m) groups where ($p=0.002$) and ($p=0.002$). However, no statistically significant difference was found between (Pre-3m) and (3m-6m) groups where ($p=0.754$).

b) Control group:

There was no statistically significant difference between (Pre-3m), (3m-6m) and (Pre-6m) groups where ($p=0.093$).

Upon comparing both groups, a statistically significant difference was found between them at each follow up interval.

Discussion

Numerous investigations of the relationship between smoking and periodontal disease have been performed over the last 15 years, and there appears to be strong epidemiological evidence that smoking confers a considerably increased risk of periodontal disease⁽¹¹⁾.

Tobacco smoking is the main risk factor associated with chronic destructive periodontal disease. The typical characteristic of smoking-associated periodontal disease is the destruction of the supporting tissues of the

teeth, with the ensuing clinical symptoms of bone loss, attachment loss, pocket formation, and eventually tooth loss⁽¹¹⁾.

Bragger ⁽¹²⁾ reviewed the radiographic parameters, their biological significance and clinical use. His review considered conventional versus digital imaging methods, the radiographic parameters obtainable in daily practice, linear measurements from landmarks to alveolar bone crest and tooth and root lengths, angular defects and furcation radiolucencies. ⁽¹²⁾.

CBCT had been applied in this study following several recommendations in an attempt to minimize the measurement errors, rendering it possible for small bone density changes to be quantitatively recorded. The same choice was also previously applied and approved by **Eickholz et al**⁽¹³⁾, since CBCT provides images with higher resolution at a lower cost, shorter examination time and less radiation dose ⁽¹³⁾.

Radiographic bone density (relative radiographic grey scale) was assessed as a rectangle covering the investigated area and the changes in density was assessed as comparative values between successive images. The means of the area measurements were pooled as an attempt to eliminate any localization measurement errors ⁽¹⁴⁾.

Radio densitometric analysis was performed in this study because it allows detection of density changes between follow up images that relate to change in bone mineral content **as proved by Berns et al.** ⁽¹⁴⁾.

Ozone has been used in the field of dentistry for various procedures, such as the management of early caries lesions, ulcerations, and herpetic lesions of the oral mucosa; sterilization of root canals and cavities; and reduction of periodontal pockets depth. Several studies have demonstrated significant improvements in the clinical periodontal parameters following SRP along with the application of Ozonated water in aggressive periodontitis patients. Recently, both gaseous and aqueous ozone have been used to complement the treatment of periodontal diseases ⁽¹⁵⁾.

Funding

The study was self-funded

Competing Interests: No conflict of interest

Ethical approval: The Ethics and research committee, Faculty of Dentistry, Suez Canal University approved the study and patients' consent was obtained.

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Parenting Style among Parents of a Child with Autism Spectrum Disorder

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Abstract

The number of children with autism spectrum disorders (ASD) is increasing every year, as well as in Indonesia so that it requires proper treatment to optimize children's development optimally. Some research that has been done states that the development of behavior in children with autism spectrum disorders is still less than optimal. One of the influential factors is the parenting style applied by parents. The purpose of this study was to determine parenting styles of parents who have ASD's children in Indonesia. This study was a quantitative descriptive. The study was conducted in three Special Needs Schools in West Java Province Indonesia, with a total sampling technique, and found 32 parents of autistic children participated in this study. The instrument used in this study was The Parenting Style and Dimensions Questionnaire. The reliability test results on the questionnaire had an Alpha Cronbach's value of 0.79 so it was a reliable instrument to use. Data were analyzed using descriptive statistics. The results of this study showed 43.8% of parents applied authoritarian style, 31.2% had permissive style, and 25% had authoritative style. It can be concluded that the most dominant was the authoritarian parenting style. This type of parenting can have a devastating effect on the development of children with autism spectrum disorders. There is a need for education for parents about the impact of parenting with developmental progress on children with autism spectrum disorder.

Keywords: *Autism Spectrum Disorders (ASD), children, parents, parenting style.*

Introduction

Autism spectrum disorders (ASD) are neurodevelopmental disorders with the main symptoms involving problems in communication, social interaction, and behavior. These symptoms vary from mild to severe. Symptoms of ASD generally appear before the age of the child reaches three years. Children with ASD generally ignore sound, vision, do not respond to social contact such as eye sight, a touch of affection, and play with friends^{1,2}. This problem occurs in the brain area, causing the child's brain does not function as a normal brain. This causes children with ASD to often close themselves from outside contact³.

At present, the case of ASD in the world is increasing. According to UNESCO, the prevalence of children with autism in the world reached 35 million children in 2011. Based on data from the Centers for Disease Control and Prevention (CDC) the prevalence of children with ASD increased to 1:68 in 2010 from a previous 1:88 children in 2008⁴. In Indonesia, the incidence of ASD is also increasing. According to the Indonesian Central Statistics Agency⁵, states that children sufferers of autism are estimated to reach 2.4 million. There is an increase in the ratio of children with ASD from the previous 1:100 to 1:88. West Java is one of the provinces in Indonesia which has the most children with ASD⁶.

Children with ASD require prolonged treatment. There are various ways of treatment in children with autism, one of which is through the role of parents in appropriate parenting style. The inappropriate pattern of parenting can cause a child to become depressed. Therefore parenting is one of the important aspects because providing appropriate care is expected to

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optimize the growth and development of children with autism disorders⁷.

Providing appropriate parenting is expected to help the development of children with autism⁸. The involvement of parents in parenting is tended to give positive impact on treatment and development of children with autism⁹. Children's behavior is influenced by close interactions between children and parents, so parents are expected to be able to apply appropriate parenting to their children. Parents must provide intensive guidance and coach for autism' children. According to Tripathi¹⁰, authoritative parenting applied by parents has a positive impact on the social interaction ability of children with autism, while authoritarian parenting causes children to often avoid to meet a new people. In addition, Mohammadi & Zarafshan¹¹ also said that permissive parenting causes children to have difficulty controlling themselves. The purpose of this study was to determine the parenting styles of parents who have children with autism spectrum disorders in West Java Province Indonesia.

MATERIAL AND METHODS

A quantitative descriptive design was used in this study. A total of 32 parents who have children with Autism Spectrum Disorder (ASD) have participated in this study that was taken with total sampling. This study was conducted in the three largest Special Needs School in the Bandung District of West Java Province, Indonesia. The instrument used in this study is Parenting Styles and Dimensions Questionnaire-Short Version (PSDQ), with alpha Cronbach values of 0.79. The questionnaire consists of 31 items parenting questions that includes the domain of warmth and control. Each statement item was measured on a 1-5 scale. The highest score shows the dominant parenting styles for each parent. Parenting style is then categorized into authoritarian, authoritative, and permissive. Data were then analyzed by univariate analysis.

Results

Characteristics of Respondents

Demographic characteristics in this study include the child's characteristics (sex, age, child's order, age of onset, the degree of ASD, the number of children) and parents' characteristics (gender, age, level of education, occupation).

Table 1. Frequency Distribution of Children Characteristics (n = 32)

Characteristics	Frequency (f)	Percentage (%)
Gender:		
Boy	22	68.8
Girl	10	31.2
Age:		
8 Years Old	3	9.4
9 Years Old	7	21.9
10 Years Old	7	21.9
11 Years Old	15	46.9
Child's order:		
First	21	65.6
Second	10	31.2
Third	1	3.1
Age of onset:		
1 Year Old	3	9.4
2 Years Old	20	62.5
3 Years Old	9	28.1
Severity:		
Mild	14	43.8
Moderate	14	43.8
Severe	4	12.5
Number of children:		
≤ 2	29	90.6
>2	3	9.4

Based on table 1, it can be seen that most autism children are male, almost half are 11 years old and is the first child in his/her family. Based on the age of onset, most children have been diagnosed with ASD at the age of 2 years and and nearly half of children with ASD are mild to moderate spectrum.

Table 2. Frequency Distribution of Parent's Characteristics

Characteristics	Frequency (f)	Percentage (%)
Gender: Male Female	21 11	65.6 34.4
Age: Early Adulthood (18-39 Years Old) Middle Adulthood (40-59 Years Old)	22 10	68.8 31.2
Level of Education: High School Graduate Post Graduate	11 18 3	34.4 56.2 9.4
Occupation: Government Employee Worker Housewife	10 19 3	31.2 59.4 9.4
Parental Status: Biological parents Adoptive parents	32 0	100 0

Based on table 2, the demographic characteristics of the parents are as follows: most are fathers, aged 18-39 years old (early adulthood), most are undergraduate degree, most are self-employed, all are biological parents.

Table 3. Frequency distribution of Parenting Styles of Parents with Autisme Spectrum Disorder (ASD)

Type	Frequency (f)	Percentage (%)
Authoritarian	14	43.8
Permissive	10	31.2
Authoritative	8	25.0

Based on table 3, it can be concluded that the most dominant parenting style applied by parents in children with autism is authoritarian (43.8%).

Discussion

In this study, authoritarian was the most dominant parenting applied by parents (43.8%), followed by permissive (31.2%) and authoritative style became the least applied (25%). In an authoritarian parenting style, the communication that occurs is a one-way communication from parents to children, while children are not allowed to express opinions. The impact of authoritarian parenting is that children become shy, full of fear, and withdraw, besides that children also find it difficult to make decisions for themselves. This can happen because children are used to being told what to do or not to do. This situation will cause children to be timid and have an impact on children's social and motor development¹².

Children with ASD who are raised in authoritarian parenting are unable to control themselves. Bahrami, Dolatshahi, Pourshahbaz, & Mohammadkhani¹³ describes the relationship between parenting patterns and temper tantrums of children with ASD, and it is found that the more parents do authoritarian parenting, the more the temper tantrum intensity in children, conversely, the lower the authoritarian parenting applied, the lower the temper tantrum intensity in the autistic child. Thus authoritarian parenting will have a negative impact on children's development because children have difficulty developing their potential. Children are required to follow what the parents want, even if it goes against the wishes of the child.

This study found that the highest proportion (86.7%) of parents who were applied authoritarian was early adulthood (18-39 years), was graduate from high school (64.3%), and as a worker in private company (64.3%). Hurlock¹⁴ said in early adulthood, parents' thinking and reasoning may still be unstable and more concerned with their own personal needs, besides that Johansen¹⁵ also said that parents who were graduate from high school level may have limited knowledge and understanding of children's development needs. Parents tend to dominate children, thus applying authoritarian parenting. Parent's occupation can also contribute to the implementation of parenting styles in children with autism. Masuda¹⁶ states that private workers tend to use physical punishment as a form of power over their children and are less concerned with child's limitation.

The second most parenting practice applied by parents in this study is permissive style (31.2%). Permissive has a negative influence on children. This is reinforced by the opinion of Sahithya¹⁷ who said that parents who apply permissive styles are actually involved in the lives of children but lack in controlling children. Bjorklund¹⁸ explained that parents with permissive styles tend to give freedom to their children but lack of control. Lack of control makes children behave inappropriately without guidance. Children with ASD who are raised by permissive parents usually have low self-esteem, lack of self-control, and poor social interaction¹⁹. Tripathi²⁰ states that parents of children with ASD face various challenges in their life and parents are less likely to apply discipline and rules to children with autism.

In this study, the authoritative style is the least adopted by parents (25%), whereas authoritative provide adequate control that can encourage children to be more independent. Parents who have authoritative parenting tend to be warmer, loving to children and more understanding of their child. Children who are accustomed to authoritative parenting will have a positive impact. Children will have self-control, self-confidence and can communicate well with their friends²¹. According to Jackman²² authoritative is appropriate parenting to apply to children with autism spectrum disorders. They explained that authoritative style has a positive impact on the development of children with autism and other disabilities.

In addition, Bi et.al²³ states that authoritative provides freedom, but still balanced with sufficient control and guidance. Parents at the same time give direction, attention, and control to children. In this authoritative style, parents may often discuss decisions and answer children's questions wisely and openly. Discussion is a pillar of problem solving. Parents support with full awareness and communicate well.

Children with ASD who raised with authoritative style, are always trained to make appropriate decisions and are ready to accept all the consequences of decisions that have been taken. Children do all activities in accordance with their interests and desires, thus enabling children to reach their potential. While parents provide control and guidance to prevent children from negative things that can damage themselves²⁴.

Conclusion

Parents have a very important role in caring for children with an autism spectrum disorder (ASD). Children with autism need balanced warmth and control at the same time. Appropriate parenting styles is very important to optimize and will have a positive impact on the development achievement of children with ASD. Therefore supports are needed to increase understanding about appropriate parenting and its impact on autistic children through counseling or parental education.

Conflict of Interest Statement: The researcher declares that there is no conflict of interest.

Source of Funding: The researcher declare there was no particular institution as a source of funding obtained in this study.

Ethical Clearance: Ethical Clearance was obtained from the Research Ethics Commission of Padjadjaran University.

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Risk Factors of Extrapulmonary Tuberculosis in Children

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Abstract

Background: Tuberculosis (TB) continues to result in high morbidity and mortality in children from resource-limited settings. Extrapulmonary TB had several of clinical appearance and complications. Hence it is important to identify the risk factors for early detection and treatment. The objective of this study is to identify factors associated with extrapulmonary TB in children.

Methods: Observational study conducted at Dr. Soetomo Hospital, Surabaya, Indonesia. Data was collected from medical records of patients who were diagnosed with extrapulmonary TB, aged 1-18 years old in the period of 2010-2018. Data were collected as risk factors were age, nutritional status, BCG (Bacille Calmette-Guerin) immunization status, contact history with adult TB patients, and HIV (human immunodeficiency virus) infection. Each risk factor was analyzed using Chi-square. Risk factors which were statistically significant ($p < 0,05$) would be analyzed using logistic regression.

Results: There were 362 patients diagnosed with extrapulmonary TB. More than a half of them are male (50,6%) and >5 years old (52,8%). Most of them already got BCG immunization (72,9%) and had normal nutritional status (73,9%). Lymphadenitis TB, bone/joint TB and miliary TB were the most extrapulmonary TB in this study. Factors associated with extra pulmonary TB were age (PR 0.51; 95% CI=0.38-0.68; $p < 0.001$), nutritional status (PR 3.14; 95% CI=2.29-4.29; $p < 0.001$), and HIV infection (PR 3.66; 95% CI=2.21-6.06; $p < 0.001$). In multivariate analysis, age, nutritional status, and HIV infection were statistically significant associated with extrapulmonary (Exp(B) 1.921; 0.326; 0.274; respectively $p < 0.001$).

Conclusion: Age, nutritional status, and HIV infections are risk factors of extrapulmonary TB in children.

Keywords: Extrapulmonary Tuberculosis, Children, Risk Factors

Introduction

Tuberculosis (TB) is an infectious bacterial disease caused by *Mycobacterium tuberculosis* (MTB), which commonly infects the lungs, but can harm any tissue.¹ World Health Organization (WHO) assumes that there are 133 new TB cases per 100.000 population.^{2,3} TB can spread to extrapulmonary with various percentage

of incidence according to the organs involved. It can be life threatening and cause morbidity and mortality.⁴ Meningitis TB in one of extrapulmonary TB that can cause death and disability.⁵ The greatest impact of extrapulmonary TB infection in children and immunocompromised individuals is the tendency to develop into severe TB.⁶

WHO providing education to the public about TB transmission and BCG (Bacille Calmette-Guerin) immunization to prevent TB infection.⁷ Although BCG immunization has been used as a TB prevention, but there are still doubts about its effectiveness in preventing TB.⁸ Contact with adult TB patients is considered to be the risk factor for TB in children,⁹ therefore WHO recommends screening household contact with TB patients and providing Isoniazid preventive treatment for children.

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Most of the previous studies are about pulmonary TB, meanwhile studies about extrapulmonary TB in children are limited. Therefore, this study aim is to study the risk factors of extrapulmonary TB in children.

Method

This study was an observational study conducted at Department of Pediatrics Dr. Soetomo General Hospital, Surabaya, Indonesia. The data was collected from medical records of patients who were diagnosed as extrapulmonary TB in January 2010 until December 2018.¹³ Patients aged 1-18 years old, diagnosed with miliary TB, meningitis TB, bone/joint TB, lymphnodes TB, tuberculous pleurisy, cutaneous TB, abdominal TB, reticuloendothelial system TB, renal TB, cardiac TB, and disseminated TB, and received anti tuberculosis drugs in Dr Soetomo General Hospital were included in this study. Some data were collected as risk factors: age, nutritional status (for ≤ 5 years old using WHO growth chart,¹¹ and for >5 years old using CDC growth chart¹²), BCG immunization status, contact history with adult TB patients, and HIV infection. Each risk factor was analyzed using Chi-square and the one which were statistically significant ($p < 0.05$) would be analyzed using logistic regression.

Results

A total 1438 cases of TB were diagnosed during period of January 2010 until December 2018. Among

the total 1438 cases, 423 cases were excluded because of incomplete data, 653 cases were pulmonary TB, and 362 cases were extrapulmonary TB. Extrapulmonary TB incidence in male patients were slightly greater than in female (50.6%). Most of the patient were >5 years old (52.8%), already got BCG immunization (72.9%) and had normal nutritional status (73.9%). The biggest three of extrapulmonary TB in this study were lymphnodes TB (35.9%), bone/joint TB (22.1%), and miliary TB (20.2%) (Table 1). Based on the age group, miliary TB was the most frequent in <2 years old group, meanwhile lymph nodes TB was the most frequent in >2 years old group (Table 2).

Age was associated with extrapulmonary TB (PR 0.51, CI95% 0,38-0,68, $p < 0.001$), malnutrition and HIV infection children were more likely to have extrapulmonary TB (PR 3.14, CI95% 2.29-4.29, $p < 0.001$ and PR 3.66, CI 95% 2.21-6.06, $p < 0.001$ respectively) (Table 3). Our subjects were divided into 3 age groups to determine significant risk factor in each group. This study found that malnutrition and HIV infected children were 2-4 times as likely to have significant risk factors of extrapulmonary TB in all age group (Table 4, 5, 6). In multivariate analysis, age, nutritional status, and HIV infection were statistically significant associated with extrapulmonary (Exp(B) 1.921; 0.326; 0.274; respectively $p < 0.001$) (Table 7).

Table 1. Characteristic of Subjects

	Extrapulmonary TB (N=362) n (%)	Pulmonary TB (N=653) n (%)
Gender		
Male	183 (50.6)	330 (50,5)
Female	179 (49.4)	323 (49,5)
Nutritional Status		
Normal	242 (66.9)	564 (86,4)
Malnutrition	120 (33.1)	89 (13,7)
Age		
< 2 year old	78 (21.5)	230 (35,2)
2-5 year old	93 (25.7)	140 (21,4)

Cont... Table 1. Characteristic of Subjects

> 5 year old	191 (52.8)	281 (43,0)
TB contact		
Yes	179 (49.4)	392 (53,7)
No	183 (50.6)	338 (46,3)
BCG Immunization		
Yes	246 (72.9)	472 (72,3)
No	98 (27.1)	181 (27,7)
HIV Infection		
Yes	19 (5.2)	110 (16,8)
No	343 (94.8)	543 (83,2)

Table 2. Extra Pulmonary Tuberculosis Incidence based on Age

	n (%)	Age		
		< 2 year old (n=78) n (%)	2 – 5 year old (n=93) n (%)	> 5 year old (n=191) n (%)
Meningitis TB	27 (2,7)	15 (19.2)	9 (9.7)	3 (1.6)
Bone/ Joint TB	80 (7,9)	7 (9)	24 (25.8)	49 (25.7)
Lymph Nodes TB	130 (12,8)	22 (28.2)	39 (41.9)	69 (36.1)
Tuberculous pleurisy	6 (0,6)	0	2 (2.2)	4 (2.1)
Cutaneous TB	7 (0,8)	1 (1.3)	0	6 (3.1)
Abdominal TB	22 (2,2)	0	5 (5.4)	17 (8.9)
Reticuloendothelial TB	1 (0,1)	0	1 (1.1)	0
Renal TB	3 (0,3)	0	0	0
Cardiac TB	73 (7,2)	0	0	3 (1.6)
Miliary TB	13 (1,3)	27 (34.6)	11 (11.8)	35 (18.3)
Disseminated TB	27 (2,7)	6 (7.7)	2 (2.2)	5 (2.6)

Table 3. Risk Factors of Extrapulmonary TB

Risk Factors	Case n (%)	PR	CI 95%	P value
Age < 2 year old > 2 year old	78 (21,5) 284 (82,1)	0.51	0,38-0,68	<0,001*#
Nutritional status Malnutrition Normal	120 (33,1) 242 (66,9)	3.14	2,29-4,29	<0,001*#
BCG immunization Yes No	264 (72,9) 98 (27,1)	0.97	0,73-1,29	0,883 #
Contact with TB patients Yes No	179 (49,4) 183 (50,6)	1.14	0,88-1,47	0,326 #
HIV infection Yes No	19 (5,2) 343 (94,8)	3.66	2,21-6,06	<0,001*#

*p<0.05 was considered statistically significant

#Chi Square test was used

(PR = Prevalent Ratio; CI = Confidence Interval)

Table 4. Risk Factors of Extrapulmonary TB in age group

Risk Factor	<2 years old group (n=78)				2-5 years old group (n=93)				>5 years old group (n=191)			
	Case n (%)	PR	CI 95%	P value	Case n (%)	PR	CI 95%	P value	Case n (%)	PR	CI 95%	P value
Nutritional status Malnutrition Normal	25 (32,1) 53 (67,9)	3,55	1,90-6,61	<0,001*#	24 (25,8) 69 (74,2)	2,89	1,43-5,89	0,004*#	71 (37,2) 120 (62,8)	2,95	1,92-4,53	<0,001*#
BCG immunization Yes No	59 (75,6) 19 (24,4)	1,00	0,55-1,82	1,000#	74 (79,6) 19 (20,4)	0,69	0,37-1,29	0,278#	131 (68,6) 60 (31,4)	1,04	0,69-1,55	0,919#
Contact with TB patients Yes No	40 (51,3) 38 (48,7)	1,04	0,62-1,73	0,897#	42 (45,2) 51 (54,8)	1,53	0,90-2,59	0,141#	94 (49,2) 97 (50,8)	1,05	0,73-1,51	0,851#
HIV infected Yes No	4 (5,1) 74 (94,9)	3,78	1,30-10,94	0,008*#	6 (6,5) 87 (93,5)	4,29	1,72-10,74	0,001*#	9 (4,7) 182 (95,3)	3,16	1,49-6,71	0,002*#

*p < 0.05 was considered statistically significant

#Chi Square test was used

(PR = Prevalent Ratio; CI = Confidence Interval)

Table 5. Multivariate Analysis of Extrapulmonary TB Risk Factors in Children

Risk Factors	Exp(B)	CI 95%	P value
Age	1,921	1,41-2,62	<0,001*#
Nutritional status	0,326	0,24-0,45	<0,001*#
HIV infected	0,274	0,16-0,46	<0,001*#
Constant	0,754		

*p<0.05 was considered statistically significant

#Logistic Regression test was used

(CI = Confidence Interval)

Abbreviations and Symbols

AIDS Syndrome	: Acquired Immune Deficiency
ART	: Antiretroviral Therapy
BCG	: Bacille Calmette-Guerin
BMI	: Body Mass Index
CD	: Cluster of Differentiation
CDC and prevention	: Centers for Disease Control and prevention
CI	: Confidence Interval
HIV Virus	: Human Immunodeficiency Virus
INH	: Isoniazid
MTB	: Mycobacterium Tuberculosis
PR	: Prevalent Ratio
OR	: Odd Ratio
TB	: Tuberculosis
WHO	: World Health Organization

Discussion

In our study, there were 362 extrapulmonary TB patients. Most of our subjects (52.8%) were over 5 years old, and male patients were slightly more frequent (50.6% vs 49.4%). Saraswati et al mentioned that there was association between TB infection and gender, it might be affected by the sexual hormones and the children's lifestyle,¹⁵ immunity response to vaccine, and immunoglobulin related to gender.¹⁶ Among the 362 extrapulmonary TB patients, 2.7% were disseminated TB, 2.7% were meningitis TB, 1.3% were miliary TB, and 72.9% were already got BCG immunization. Although, BCG immunization can provide protection against disseminated TB infection, but it could not give maximum protection against the other types of TB.¹⁵

In the age group of <2 years old, the three highest prevalence were miliary TB (34.6%), lymphnodes TB (28.2%), and meningitis TB (19.2%). Wallgren in 1948 stated that hematogenous spread occurred 1-3 months after primary infection would develop into TB meningitis and miliary TB in young children,¹⁷ and WHO estimated that more than 50% of TB cases in children younger than 5 years old were disseminated TB.² Meanwhile in age group of 2-5 years old and more than 5 years old, lymphnodes TB had the highest prevalence (41.9% and 36.1%, respectively). Previous study found similar results.¹⁸

In this study, age was associated with extrapulmonary TB (PR 0.51, CI 95% 0.38-0.68, p<0.001). Marais et al mentioned that children aged less than 1 year old had higher prevalence of disseminated TB compared with children aged 1-2 years old and more than 5 years old,¹⁹ because infants' immunity system were different from adults and it could not function properly. Therefore, infants have 5-10 times greater risk of suffering active and severe TB.²⁰

This study found that malnutrition was a significant risk factor for extrapulmonary TB in all ages group (PR 2.89-3.55 p<0.05). Other studies has similar result.³ Immune mechanism against MTB infection is depend on interaction of monocytes, macrophages, T lymphocytes and cytokines in which inadequate nutrition will reduce its interaction.²¹ Malnutrition children have less type 1

cytokines (Interleukin-2 and Interferon- γ) which were primary immunity mediators.²² Changes of these cell-mediated immune could increase the susceptibility to infection. There are many studies about malnutrition and TB, but it is difficult to prove whether malnutrition or TB that precede one another. Weight loss and malnutrition in TB patients can be caused by decreased food intake or factors due to TB disease itself. Altered metabolism of TB can lead to “anabolic blocks,” where food protein is used more for energy production rather than anabolism.²³

This study showed that BCG immunization status was not associated with extrapulmonary TB. Previous studies found similar result.²⁴ There are many factors affecting immune response to BCG vaccine, such as where the immunization is done, maternal immunity factors, late BCG vaccine, and others.²⁵ The cell wall component of BCG vaccine will occupy macrophage receptors as is done by MTB, therefore BCG immunization has no protective effect if it is given to people who have been already infected or sensitized by MTB. Contact with adult TB patient was not associated with extrapulmonary TB in this study. Many factors affect host defense against pathogens including how MTB induce necrosis by destructing mitochondria inner membranes and preventing plasma membrane repairments which is mediated by lysosomal and Golgi. If MTB cannot be killed by innate immunity response, therefore MTB will replicate and spread.²⁶

Among the 362 extrapulmonary TB patients, 5% of our subjects had HIV infection and children with HIV infection were 3-4 times as likely to have extrapulmonary TB. Previous studies stated that HIV infection is associated with TB infection on children.²⁴ HIV infects T CD4+ and macrophage and MTB also mainly infect macrophage in which to eradicate intracellular microbial pathogens. Therefore, low T CD4+ cells will increase risk of TB infection. TB and HIV are chronic and progressive disease which will impair host protection by promoting an immunoregulatory phenotype characterized by an attenuated T cell response and leads to failure of normal homeostatic control of the inflammatory response.²⁷

Conclusion

Age, nutritional status, and HIV infections are risk factors of extrapulmonary TB. Meanwhile BCG immunization and contact with adult TB patients are not

proven as risk factors.

Ethical Clearance : Approved by Ethical committee in health research Dr. Soetomo General Hospital Surabaya, 0943/KEPK/II/2019

Source of Funding : self

Conflict of Interest : there are no conflict of interest

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A community-based Cross-Sectional Survey of Primaquine Adherence in Jambi Province, Indonesia

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Abstract

Background: *Plasmodium vivax* is one of malaria parasite species that can lead to life-threatening disease. Primaquine is the only known and licensed drug prominently against *Plasmodium vivax* hypnozoites stage. However, lack studies have demonstrated community adherence information to such particular treatment medication.

Material and Method: A cross-sectional community-based study design was used in the study. The study population is the person visiting local primary health care with signs or symptoms related to malaria and detected microscopically with *Plasmodium vivax* infection. After prescribed with a standard dose of primaquine, adherence was measured by a structured questionnaire at the end of the completion day of the medication course.

Results: Malaria caused by *Plasmodium vivax* in Lembah masurai sub-district started to be prevalent from 2014 to the end of 2017. The data indicated that malaria foci have been maintained in the area in the past five years. A total of 44 individuals were recruited in the study. In total, 11.4 % of the patients were certain non-adherence, 27.3% were probable non-adherence and 61.4% were probable adherence. Primaquine prescription is associated with non-adherence behavior (P-value = 0.044, OR: 8 [CI: 0.81-79.02]).

Conclusion: Our study concludes that simplifying primaquine medication therapy by not adding another non-related drug may elevate the adherence level.

Keyword: Primaquine, adherence, risk factors, malaria, community-based

Introduction

Many parts of the world still have a high risk of being infected by *Plasmodium vivax* [1]. In Indonesia, malaria cases caused by *Plasmodium vivax* is almost as much as *Plasmodium falciparum* [2]. Out of those, death led by *Plasmodium vivax* is still considerably high [2]. In the worst situation, in the area where limited foci of malaria, *Plasmodium vivax* takes an important role in maintaining malaria transmission by importation

[2]. To overcome such burden, primaquine has been recommended by the World Health Organization (WHO) as it is the only known and licensed drug prominently against *Plasmodium vivax* hypnozoites stage [3]. According to Indonesia regulation of ministry of health, primaquine needs to be prescribed over the course of 14 days treatment [4]. By such a long prescription of the drug, there may be inadequate adherence across all population.

Several studies have tried to measure adherence of primaquine in population. As described in review studies, 14 days regimen of primaquine is underrated to be adherence for a population [5, 6]. Only a view of original papers has described the adherence level to primaquine in a population. A significantly low level of adherence of primaquine medication has been observed

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in Thailand where 76.21% of the 206 patients prescribed with primaquine did not complete the treatment regimen [7]. The risk factor of non-adherence in the studied group of the population was correlated with knowledge of malaria and access to drug prescription [7]. A similar circumstance has also been reported in Peruvian Amazon where adherence of 7-days prescription of primaquine was estimated only 62.2% [8]. Perceived adverse effects have been notably reported to be the reason for non-adherence behavior in the area [8]. In contrast, *Cheoymang A et al* have found a high adherence of primaquine based on both patient's self-report and pill counting method (100%) and drug concentration of primaquine metabolite (95-98%) [9]. The discrepancy between the studies may be due to a different method used to measure adherence. Additionally, diversity of area where the study done may be another reason of different adherence result found.

It is still considered a view number of papers described the adherence of primaquine medication in population. In Indonesia, such finding has not been discovered yet. Therefore, in order to uncover the situation of adherence to primaquine treatment in Indonesia, we have done the current research accordingly. The information herein will help policy maker to plan a better program for eliminating malaria especially caused by *Plasmodium vivax* by strictly monitoring the adherence behavior of such treatment in the population.

Method

Study area

The study is located on lembah masurai sub-district, Jambi province, Sumatra island, the western part of Indonesia. Lembah masurai has an area of 689 km² with a total number of 15 villages. Its elevation is 540 m above sea level. The total number of populations in the area is about 26.579. Rainfall is estimated to be highest in November to February. The annual temperature is estimated ranging from 22.9-31.1° C. Malaria in the area is predominantly caused by *Plasmodium vivax*, nearly no *Plasmodium falciparum* found.

Study design

A cross-sectional community-based study design was used in the study.

Study population

The study population is the person visiting local primary health care with signs or symptoms related to malaria and detected microscopically with *Plasmodium vivax* infection. All positive infection of *Plasmodium vivax* was then prescribed with a standard dose of primaquine according to a national guideline of the ministry of health, Republic of Indonesia. The study was conducted between January to June 2018.

Inclusion and exclusion criteria

Patients included in the study were Lembah masurai resident who visited the primary health care with tympanic temperature ³ 37.5° and signs and symptoms related malaria which then microscopically detected with *Plasmodium vivax* infection, able to participate and able to stay at home in the visiting schedule. A person who had any sign or symptom related to severe or complicated malaria and a pregnant woman were excluded from the study.

Laboratory procedure

Any patient who had an above-mentioned sign or symptom was then taken a glass slide for further examination. The slide was prepared using absolute methanol for fixation and Giemsa for staining. A negative slide was determined after no parasite detected across 200 fields of view. All laboratory procedure was done by a certified microscopist.

Measurement of adherence

Adherence was classified by certain non-adherence, probable non-adherence and probable adherence. Certain non-adherence was defined when pills remaining on the blister package after 14 days of primaquine medication irrespective of a correct or incorrect number of pills described by the patient. While probable non-adherence was when patient described an incorrect number of pills or time they need to consume. When no pills remaining found or correct number of pills or time described by the patient, they were considered to be probable adherence. Additionally, adherence to primaquine was measured at the day of the completion day of treatment course.

Data management and analysis

Adherence information of the population alongside

with socio-demographic information and knowledge, attitude and practice of local health workers toward malaria elimination were presented in proportions in percentages. All analysis was performed with SPSS version 20.0. (Armonk, NY: IBM Corp). Chi-square test was used to discover any potential association between adherence and the risk factors.

Ethical approval and informed consent

Ethical approval was sought from Universitas Muhammadiyah Semarang [22/EC/FKM/2017]. All patients were taken informed consent before they participate.

Results

Malaria situation in Lembah masurai sub-village

Malaria caused by *Plasmodium vivax* started to be prevalent from December 2014 with an incidence rate of 0.5. The case was highest in January 2015 with an incidence rate of 0.75 and maintained until the end of the year 2015. Limited cases have been observed during the year 2016 with the highest incidence rate of 0.2. At the beginning of the year 2017, *Plasmodium vivax* started to increase throughout the year (**Figure 1**). No *Plasmodium falciparum* has been detected in the area based on the report of local primary health care personnel. The data indicated that malaria foci have been maintained in the area in the past five years.

General characteristics of the samples

A total of 44 individuals were recruited in the current study. There were 26 (59.1%) male and 18 (40.9%) female individuals. The vast majority of samples were adolescent (81.8%) aged 6-13 years old and the rest were young child (18.2%) aged 2-5 years old. Approximately half of the patients (43.2%) were able to take medication by themselves and the other half were given by their caretakers (50% by father or mother and 2.3% by grandfather/grandmother or brother/sister or uncle/aunt). The majority of education of the samples were either complete or incomplete primary school (63.6%), 15.9% of them were unable to write or read, and the rest were higher than primary school (20.5%). The highest education of caretakers was primary school (27.3%), higher education (15.9%), secondary high school (9.1%) and primary incomplete and unable to write or read

(2.3%).

Level of adherence

Of the 44 samples recruited, 5 (11.4%) had remaining primaquine pills on their blister defined as certain non-adherence. There were 13.6% defined as probable adherence as no remaining pills found in their blister package. Out those whose blister unable to see, 47.7% were considered probable adherence as they were able to describe correctly time and number of pills taken and 27.3% were considered probable non-adherence as they were unable to describe correctly time and number of pills taken. In total, 11.4 % of the patients were certain non-adherence, 27.3% were probable non-adherence and 61.4% were probable adherence. Therefore, if we restrict the classification into adherent and non-adherent only, there were 38.6% non-adherent and 61.4% adherent individuals (**Table 1**).

Risk factors of adherence

Out of six variables, there is only one variable associated with non-adherence behavior. The variables are sex, age group, primaquine prescription, understanding of malaria cause, the existence of bed nets and understanding of primaquine use. Primaquine prescription is associated with non-adherence behavior (P-value = 0.044) (**Table 3**). The odd ratio of primaquine prescription with other drugs is 8 indicating that a person who has been given primaquine medication with other drugs may have 8 times higher of possibility to be non-adherent.

Reason of incomplete, incorrect and correct intake

The major reason of incomplete intake of the pills is patient felt unwell/the medication was not working properly (60%) (**Table 2**). The other reasons are patient was cured and did not need to continue the medication (20%) and patient was cured and saved the pills for other occasions (20%). Reasons given for incorrect intake are patient/caretaker claims that incorrect instruction was given (70.6%), patient/caretaker thought that the patient will cure faster (11.8%), patient cannot swallow the pills (5.6%) and others (11.8%). Additionally, correct instruction was given in the clinic is the major reason for correct intake (84%).

Table 1. Adherence level to primaquine medication in Lembah masurai sub-district

	Incomplete/incorrect intake described	Complete/correct intake described
Calculation of adherence		
No blister	12	21
Blister empty	0	6
Blister with pills	5	0
Classification of adherence		
Certain non-adherence	5	11.4%
Probable non-adherence	12	27.3%
Probable adherence	27	61.4%
Adherence status		
Non-adherent	17	38.6%
Adherent	27	61.4%

Table 2. Reasons given by patients for incomplete, incorrect and correct ACT intake.

Reason for ACT intake	No	Percent (%)
Reasons given for incomplete intake (pills remaining)		
Patient was cured and didn't need to continue the medication	1	20.0
Patient was cured and saved the pills for other occasion	1	20.0
Patient felt unwell/ the medication wasn't working properly	3	60.0
Reasons given for incorrect intake		
Patient/caretaker thought that the patient will cure faster	2	11.8
Patient/caretaker claims that incorrect instruction was given	12	70.6
Patient can't swallow the pills	1	5.6
Others	2	11.8
Reasons given for correct intake		
Patient/caretaker/household member have taken the same pills before, so understood how to take it	3	12.0
Correct instruction was given in the clinic/primary health facility/sampling location	21	84.0
Patient was helped by local community health volunteers	1	4.0

Table 3. Associated factors of non-adherence behavior to primaquine medication

Risk factors	Adherent (%)	Non-Adherent (%)	OR	95% CI	P value
Patient Sex					
Male	18	8			
Female	9	9	0.44	0.13-1.54	0.198
Patient age group					
Adolescent & adult	23	13			
infant & young child	4	4	1.77	0.38-8.28	0.466
Primaquine prescription					
Primaquine only	26	13			
Primaquine with other drugs	1	4	8	0.81-79.02	0.044
Malaria caused by mosquito bites					
No	15	13			
Yes	12	4	2.6	0.67-10.06	0.160
Bed nets observed					
No	0	2			
Yes	27	15	10.19	0.46-227.32	0.068
Understanding of primaquine use					
No	15	14			
Yes	11	3	3.42	0.79-14.88	0.092

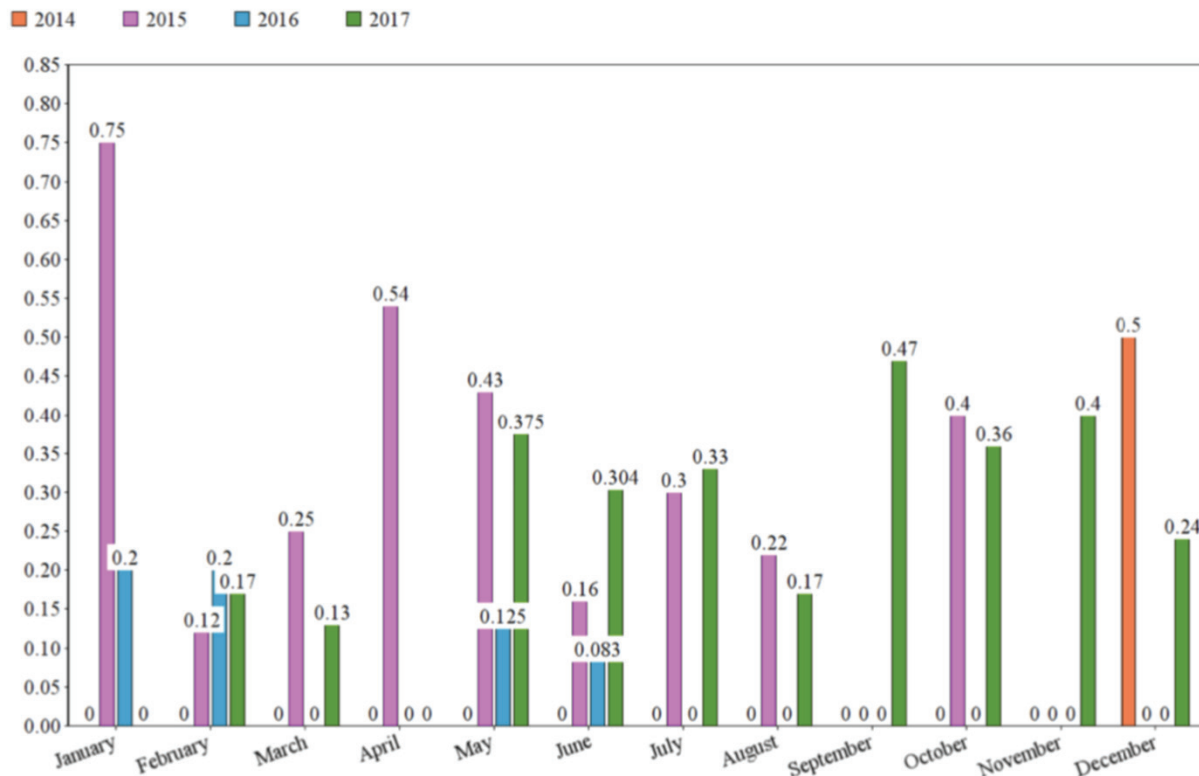


Figure 1. Incidence of malaria caused by *Plasmodium vivax* in Lembah masurai sub-district between 2014-2017. X axis: number of incidence; Y axis: Month and year

Discussion

Preserving a high adherence behavior toward antimalarial drugs, especially primaquine, is the key to achieve malaria elimination and to prevent maintenance of malaria foci and importation [10-13]. Primaquine is the only known and licensed drug against hypnozoite form of *Plasmodium vivax*. A standard 14 days course of treatment have been described by WHO. However, with such a long time of treatment, it would be a poor adherence of the community.

In our study, we have demonstrated a relatively low level of adherence to primaquine medication in our study setting. Our study is in agreement with the previous study in Peruvian Amazon [8]. The worst situation has been found from Thailand community [7]. A variety of risk factors underlying non-adherence behavior has been observed between study localities. In our study setting, the risk of being non-adherent is a complementary prescription of primaquine with other drugs. Non-adherence behavior related to treatment complexity has been observed from an anti-hypertensive drug [14] and cardiovascular medication [15]. The complexity

of medication has proven to lower adherence level in a community, thus instead of prescribing cascade by giving other drug, health professionals should give only primaquine tablets for identified *Plasmodium vivax* infection. Additionally, giving the community knowledge regarding malaria etiology, sign and symptom and general medication may help to elevate adherence level [7].

The discrepancy of measuring adherence has been observed that may include social desirability bias [16]. More advanced measurement including blood metabolite has been reviewed. A carboxy-primaquine concentration of 80 ng/ml at day-4 may help to measure precisely adherence in a community [16]. As shown by *Cheoymung et al* as they measured community primaquine adherence based on drug metabolite which shows a 100% adherence [9]. This high adherence level may due to the study used a strict protocol that requested the patients to return to the clinic at day 3. In contrast, our study and others [7, 8] used a non-strict protocol that did not request the patient to return to the clinic instead of visiting them at home at the completion day of the drug medication time. Further

research needs to combine structured questionnaires and drug metabolite with non-strict protocol to avoid social desirability bias.

Conclusions

Plasmodium vivax is one of malaria parasite species that can lead to life-threatening disease [12]. The relapse caused by this particular species is essential due to approximately 80% of reported *Plasmodium vivax* infection resulted from hypnozoite-derived relapse [13]. To tackle such issue, strict monitoring of adherence to primaquine medication is needed as it is the only known and licensed drug against *Plasmodium vivax* hypnozoite form. However, our study presented a low level of community adherence toward primaquine medication. Identified associated factor related to non-adherence behavior in our setting is primaquine prescription with another drug. Our study concludes that simplifying primaquine medication therapy by not adding another non-related drug may elevate the adherence level.

Source of Funding: This research is supported by Lembaga Pengelola dana Pendidikan (LPDP), ministry of finance, Republic of Indonesia.

Conflict of Interest: All authors declare that they have no competing interest.

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Heat Strains among Diesel Power Plant Operators and Related Factors

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Abstract

Introduction: Research in occupational heat stress and heat strain in developing countries is limited because of several challenges and constraints.

Objectives: To describe the prevalence of heat strains of diesel power plant operators and analyze the related factors.

Method: Cross-sectional design has been carried out on the diesel power plant operators in the Indonesian state electricity company (N=35). The research variables consisted of heat strain, age, working period, nutritional status, hydration status and heat stress. Measuring instruments used consisted of a heat strain score index (HSSI), heat stress monitor, weight scale, microtoise, and questionnaire. Cramer's V test and odds ratio were applied to see an association between heat strain prevalence and related factors.

Results: 35.8% of diesel power plant operators experienced heat strain in the yellow zone/alarm category, 64.2% was included in the green zone/save category. The heat strain experienced by the operator was significantly related to age ($p=0.000$), years of service ($p=0.000$), hydration status ($p=0.057$) and heat stress ($p=0.000$).

Conclusion: The occurrence of heat strains began to show the alarm stage, this requires efforts to control heat pressure and others variables in order to prevent the heat strain does not get worse.

Keywords: Heat stres, heat strain, age, working period, hydration status, nutrition status, diesel power plant operators.

Introduction

Occupational heat strain (OHS) is an occupational health problem that requires the attention of researchers and practitioners of occupational health and safety because of its detrimental impact. Several studies have reported that OHS adversely affects workers' health, reduces workers performances, reduces worker

productivity and even causes death.¹⁻⁴ OHS is defined as the body's physiological response to heat stress (e.g., sweating). Heat stress itself is the net heat load to which a worker may be exposed from the combined contributions of metabolic heat, environmental factors, and clothing requirements.⁵

Exposure to heat at work caused a variety of workers' health problems ranging from minor problems such as mild skin rash to the fatal condition of heatstroke. According to Srinivasan et al,⁶ some of the acute health effects of excessive heat exposure include sweating,

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dehydration, salt loss, loss of perceptual and motor performance, heat exhaustion, loss of ability to work intensively due to heat exhaustion, increased accident risk, increased body temperature. Meanwhile, chronic health effects of excessive heat exposure include worse clinical status for people with common chronic diseases, kidney damage due to daily dehydration if lack of water access.

There are various risk factors associated with OHS, including personal risk factors such as heat acclimation as well as environmental factors and high metabolic rates,⁷ acclimatization, water intake adequacy rate and body mass index,⁸ heat exposure in the workplace,⁹ air temperature & core body temperature,¹⁰ lack of acclimatization and volume depletion.¹¹ More complete, NIOSH details the factors that can affect OHS i.e environmental factors (high temperatures, direct sun exposure, lack of wind and proximity to engines or other hot equipment), activities, no acclimatization, medications, dehydration, and others.¹² The prevalence of OHS is also related to the climatic conditions of a country, Kjellstorm et al¹³ reported that workers in tropical and sub-tropical countries are very at high risk for experiencing heat strains

Research in OHS in developing countries is still lacking because of several challenges and constraints. Few challenges are a permission from industries to publish the data, resistance for change, and improper record of heat/any occupational disease, and paucity in a number of studies.⁶ Indonesia is a developing country with a tropical climate.¹⁴ In the context of early detection of heat strains experienced by workers, this study aims to analyze the prevalence of heat strains of diesel power plant operators in the Indonesian state electricity company, and analyze the factors that influence it.

Method

A cross-sectional study was conducted between September until October 2019 on all diesel power

plant operators (total sampling) in the Indonesian state electricity company (N=35). Age and working periods were measured using a questionnaire. The OHS was measured by heat strain score index (HSSI),^{15,16} and the score result of heat strain are categorized into 3 i.e <13.5=green zone/save; 13.5-18=yellow zone/alarm level; >18=red zone/danger level.

Work climate was measured using a heat stress monitor (Questemp-34 heat stress meter, USA) with a wet bulb globe thermometer (WBGT) parameter.¹⁷ The determination of the threshold limit value (TLV) of work climate based on Indonesia's Minister of Manpower Regulation number 05 of 2018, where the TLV of working climate with the Wet Bulb Globe Temperature (WBGT) parameter is 28°C. The nutritional status is measured based on body mass index,¹⁸ with the following categories: BMI<17.0 (heavy underweight), BMI<17.0-18.5 (light underweight), BMI>18.5-25.0 (normal), BMI>25.0-27.0 (light fat) and BMI>27.0 (heavy fat). Hydration status is measured based on the volume of consumption of drinking water per day in units of glass (@ 240 ccs), if the volume of drinking water <8 glasses per day is categorized as less hydration if the volume of drinking water consumption> 8 glasses per day is considered sufficient.¹⁹

Cramers V test was applied to see the correlation between heat strain and independent variables (age of operators, working period, nutritional status, hydration status, and heat stress). Data analysis using the Statistical Package for the Social Sciences (SPSS ver. 21, Chicago, IL, USA).

Result

Distribution of age, working period, work climate, nutritional status (based on body mass index), hydration status, work climate and its correlation with occupational heat strain are shown in Table 1.

Table 1. Related factors associated with occupational heat strain (OHS) of diesel power plant operators (N=35) in Indonesian electricity state company

Variables	Work section										p	r	OR
	SWD		Sulzer		MFO		Maintenance		Office				
	n	%	n	%	n	%	n	%	n	%			
Age (years)											0.000	0.496	5.86
< 40	10	18.9	5	9.4	2	11.3	6	11.3	7	13.2			
> 40	16	11.3	7	13.2	2	3.8	2	3.8	6	11.3			
Working period (years)											0.000	0.506	3.49
< 10	10	18.9	5	9.4	1	1.9	6	11.3	1	3.8			
> 10	6	11.3	7	13.2	3	5.7	2	3.8	11	20.8			
Nutritional status											0.204	0.294	
Heavy Under weight	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0			
Light Under weight	0	0.0	1	1.9	0	0.0	0	0.0	0	0.0			
Normal	10	18.9	8	15.1	1	7.5	4	7.5	7	13.2			
Light fat	4	7.5	0	0.0	1	3.8	2	3.8	3	5.7			
Heavy fat	2	3.8	3	5.7	2	3.8	2	3.8	3	5.7			
Hydration status											0.057	0.428	1.21
Less	8	15.1	6	11.3	2	3.8	0	0.0	3	5.7			
Sufficient	8	15.1	6	11.3	2	3.8	8	15.1	10	18.9			
Work climate											0.000	0.554	2.39
< TLV	12	22.6	7	13.2	1	1.9	0	0.0	13	24.5			
> TLV	4	7.5	5	9.4	3	5.7	8	15.1	0	0.0			
Heat Strains													
Green zone/save	10	18.9	8	15.1	4	7.5	1	1.9	11	20.8			
Yellow zone/alarm	6	11.3	4	7.5	0	0.0	7	13.2	2	3.8			
Red zone/danger	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0			

Note: all % of total, SWD= Strork werkspor diesel, MFO= Marine fuel oil.

Overall, most operators were less than 40 years old (64%), with the largest percentage being operators in the SWD section (18.9%), most operators had working periods of less than 10 years (54.7%) with the largest percentage in the SWD section (18.9%), nutritional status was mostly in the normal category (62.2%) with the largest percentage being in the SWD (18.5%), hydration status was mostly sufficient (more than 8 glasses per day) (64.2%) with the largest presentation in the office and SWD (18.9%), as well as maintenance (18.9%) and Sulzer (11.3%). Most operators are exposed to heat stress below TLV (62.2%), however, there are some operators who are exposed to heat pressure above TLV, i.e 15.1% operators in maintenance, 9.4% in the Sulzer section, 7.5% in the SWD portion and 5.7% in the MFO section.

The heat strain score index of most operators shows is still included in the green zone/save category (64.2%). However, there are several operators in various work sections that fall into the yellow-green/alarm category, including 13.2% in the maintenance section, 11.3% in the SWD section, 7.5% in the Sulzer section and 3.8% in the office section. Cramers V statistical test results showed that heat strain was significantly related to age ($p=0.000$, $OR=5.86$), working period ($p=0.000$, $OR=3.49$), hydration status ($p=0.057$, $OR=1.21$) and heat stress ($p=0.000$, $OR=2.39$). All variables significantly related to heat strain have an odds ratio of more than 1 which indicates risk factors.

Discussion

Prevalence of heat strain

We found 35.8% of diesel power plant operators ($N=36$) experiencing heat strain in yellow zone/alarm categories, while 64.2% of operators still included in the green zone/save category. This finding is quite interesting and proves that workers in Indonesia (one of the developing countries with tropical climate) experience heat strain. This requires the attention of stakeholders to control the work environment and prevent further adverse effects so that the heat strain does not change to red zone/danger. This result proves the previous hypothesis by Kjellstorm et al,¹³ which states that workers in tropical and sub-tropical countries are very at high risk for experiencing heat strains.

Association between age and working period of operators with heat strain: The results prove that age and working periods are significantly related to heat strain. In accordance with previous theories, age-related changes in sweating and skin blood flow. Older individuals exhibit alterations in sweating during heat stress (decreasing functional of sweat gland), a delayed core temperature onset threshold for sweating, reduction in evaporative heat loss and decreasing ability to respond enable the distribution of internal heat content among various tissues in the body.²⁰ However, the results of this study are not in line with the research of Sutono et al,⁸ which concluded no relationship between the age and heat strains in construction workers.

The results found an association between working period and heat strain. This result makes sense because the working period is closely related to the accumulation of work environment hazard exposure. The longer the operator's working period, the possibility of exposure to various hazards at workplace.²¹

Association between hydration status with heat strain: The results showed the operator's hydration status was significantly related to heat strain. The results of this study are in line with previous studies by Bolghanabadi²² who concluded that hydration status is significantly related to heat strains in food industry workers in Mashad. This finding is consistent with Riebl and Davy's opinion²³ which states that during vigorous physical activity in a hot environment, the body experiences a lot of fluid loss with total water output is estimated to be around 1500–3100 mL/d.

Working in hot areas will affect kidney health by increasing the risk of urine crystal formation,²⁴ therefore adequate rehydration is needed so that it can offset the release of body fluids due to exposure to heat and can reduce the risk of crystallization of urine.

Association between work climate with heat strain: This study found that heat strain was significantly related to heat stress. This result can be explained from previous theories that explain working in a hot place will trigger the body's thermoregulation system to remove heat from the body, including through the expenditure of sweat. This condition will cause the body will experience a lot of loss of mineral salts, causing the body to dehydrate, and will affect other body systems causing

various heat strain complaints.¹¹

The results of this study further strengthen previous studies in various industries which conclude that heat exposure in the workplace is related to heat strains.²⁵⁻²⁸ An important implication of this research is to reduce the heat strain, the management company should make decreasing heat exposure and improve the operator's hydration status by providing adequate drinking water in the workplace. As operators age and service life increases, companies are advised to reduce workloads and carry out shifting and limiting work time. According to NIOSH/CDC,³ decreasing heat stress can be done by engineering control, work and hygienic practices, heat acclimation plan, training and practicing heat alert program.

Conclusion and recommendations

35.8% of diesel power plant operators (N=36) experiencing heat strain in yellow zone/alarm categories, while 64.2% of operators still included in the green zone/save category. The heat strain was significantly related to age ($p=0.000$, $OR=5.86$), working period ($p=0.000$, $OR=3.49$), hydration status ($p=0.057$, $OR=1.21$) and heat stress ($p=0.000$, $OR=2.39$). All variables significantly related to heat strain have an odds ratio of more than 1 which indicates risk factors. To reduce heat strain, management companies are advised to carry out engineering control, administrative control, work and hygienic practices, and implement a heat alert program.

Acknowledgement: The authors are very grateful to all diesel power plant operators and management of the Indonesian electricity state company who participated in this study.

Ethical Clearance: This study was reviewed and approved by the Ethical Commission of Health and Medical Research, Faculty Medicine, Mulawarman University, Indonesia.

Source of Funding: The author(s) received no financial support for the research, authorship, and publication of this article.

Conflict of Interest: Nil

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A Study to Assess Soft Skills of Engineering Graduates in Ernakulam District, Kerala

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Abstract

Soft skills has become a buzz word in the corporate world. Soft skills is greatly regarded by top-notch multinational companies in hiring of employees around the world. This has indeed , raised the bar for candidates to horn their soft skills alongside academics for a successful career. A survey by Federation of India commerce and industry revealed 70 percentage of employees lacked soft skills ⁽¹⁾ and 97 percentage of engineering candidates lacked communication skills. ⁽⁷⁾ Statically, speaking candidates lacked employability skills. The study is primarily focused on engineering graduate (final year) to assess their soft skills competency. Engineering colleges in Ernakulam district were selected as sample for the basis of study .The data were collected through survey questionnaire and workshops. Questionnaire comprise of verbal and non-verbal communication skills ,decision making skills, team work, responsibility, problem solving skills and willingness to learn. The research helped in Indenification of soft skills gap (employability skills) among engineering students and at same time to train students to increase their soft skills competence.

Keywords: *soft skills; employability skills; engineering college; candidates; employees*

Introduction

Soft skills are hard to Crack”. softs skill are “non-technical, intangible, personality specific skills” by Hewitt Sean ⁽²⁾. skills that which is unique and varies from person to person. Soft skills complement hard skills but it’s different in its applications. soft skills are non-technical skills whereas hard skills are technical skills. ⁽²⁾ Soft skills are more needed than hard skills ⁽³⁾ therefore is an increase in soft skills assessment among employers, this has led to increase in demand for soft skills in entry-level position. There is a growing demand in hiring based on soft skills, where soft skills are the determining factor in selection. ⁽⁴⁾ In current scenario multinational companies are giving more preferance for soft skills over hard skills.⁽³⁾ Majority of the vacancies were opened irrespective of their discipline of study. ⁽⁴⁾ Several studies on soft skills reveals the growing demand for soft skills.⁽⁵⁾ Companies are specifically looking for soft skills which highly influence their performance at work place. ⁽⁶⁾ Soft skills such as, Emotional intelligence and Personality traits which are crucial factor for success of an organization i.e. communications skills; team work, interpersonal

skills and ethics. Soft skills had more influence on their performance at job than technical skills. ⁽⁶⁾ Hence due to soft skills gap among graduates which creates the situation of unemployment.⁽⁷⁾This study has helped in assessing of soft skills among engineering graduates, which are crucial for employment.

Statement of the Problem

Every year there are number of engineering candidates graduating from college. But the employability rate among the engineering graduates is quite low as compared to pass-out ratio. Employability report of engineering graduates showed the reason of low employability rate among engineering graduates.⁽⁸⁾

- 71.23% inadequate soft skills ⁽⁸⁾
- 97% lacked spoken English language skills⁽⁸⁾
- 61% lacked grammar skills ⁽⁸⁾
- 7.1% candidates can express themselves in English⁽⁸⁾

Articulation and Accent was a major issues faced by candidates ⁽⁸⁾

The study revealed there is a considerable gap of soft skills competency among the engineering graduates. Lack of soft skills (employability skills) is the major reason for unemployment of engineering graduates.

Literature Review

India has become a major player in international market especially in service sector. Minority of Indian students considered effective communication skills is indispensable for one's success. Soft skills such as English language skills has become a basic to prerequisite for getting a job.

Unemployment due to lack of soft skills. "90 % of all Indian Engineering university graduates are unemployable due to inadequate of soft skills" ⁽⁸⁾ Soft skills has 85% influence on career growth of an employees whereas hard skills has 15% ⁽⁹⁾ Students with good soft skills has an upper hand in job market. Soft skills are not just for professional growth but also for personal wellness. ⁽¹⁶⁾ Some of the crucial employability skills which are important in every candidates seeking employment are like positive attitude, communication, teamwork, self-management, willingness to learn, thinking skills, resilience. ⁽¹⁰⁾ These days one of the challenges most of the employer's are facing is shortage of skills Entry-level software graduates lacked communication and social skills, "Communication skills remain a major concern for employers. ⁽¹¹⁾ In India there is a double fold increase in the number of engineering graduates but the graduates who are employable is far below from the reality. This clearly shows the situation where there is a skills gap, lack of expected set's of skills from employees and skills possessed by employees. These situation arise where candidates are not on groomed at institutional level on soft skills. These days every organization is primarily looking for soft skills in an employee and majority of human resource manager consider soft skills as a crucial factors in hiring of employees. ⁽¹²⁾ Possessing hard skills without soft skills it's futile. The study showed soft skills such as verbal and non-verbal communication skills, decision making skills, team work, responsibility, problem solving skills and willingness to learn are crucial soft skills required in competitive job market. Soft skills has become a

indispensable part of every employees irrespective of industry, organization or position. This study showed lack of job-readiness due to skills gap (employability skills) among the engineering students. Which in turn creates the situation of unemployment. ⁽¹³⁾ In order to make candidates employable in the competitive job market students needs to be train on soft skills for better career prospects.

Objectives of the Study

1: To assess the soft skills competency of engineering graduates

2: To find out the gap of soft skills of engineering graduates

Research Methodology

For the basis of study data were collected from engineering colleges in Ernakulam district. Around 600 candidates participated in the survey 464 filled in survey forms were received which were reliable for the study. Questionnaire was developed based on keeping in view the soft skills most sort by multinationals companies. The questionnaire were formulated soft skills listed out by Bailey ⁽¹⁴⁾ and Mossa, The model of soft skills assessment. ⁽¹⁵⁾ Likert scale score coded as 1: always 2: often 3: sometimes 4: rarely 5: never was used in the questionnaire. Primary data was collected through survey. Questionnaire comprise of verbal and non-verbal communication skills, decision making skills, team work, responsibility, problem solving skills and willingness to learn. Pilot study was carried out to test the reliability which showed .70 (Cronbach alpha=.70). After the scrutiny and rectification the final questionnaires were prepared. Secondary data were collected through personal interview and workshops.

Data Analysis

Collected data were analysed using SPSS Statistics 21. Mean and Average were calculated of each soft skills to find out the gap scores of each skills. The mean range from 2.50 to 3. Verbal communication showed the highest mean value of 2.58 and willingness to learn showed lowest mean value of 1.79. Most of the engineering graduates soft skills were at average it showed there is a considerable soft skills gap.

Table:1 Engineering graduates participated in the survey

Sr.No:	Department	Respondent (students)
1	Information technology	60
2	Mechanical engineering	103
3	Civil engineering	149
4	Computer science	72
5	Electrical engineering	80
	Total. (N)	464

Table:2 Mean and Standard deviations of soft skills of engineering graduates

Soft skills	Mean	Std. Deviation
Verbal	2.583141933	0.874061462
Non-verbal	2.462598773	0.064706986
Decision making	2.481477225	0.916880619
Problem solving	2.520230618	0.908766588
Responsibility	2.068917148	0.924343694
Teamwork	1.992309058	0.92969306
Willingness to learn	1.791311721	0.828027238

verbal communication skills was assessed. Which is a crucial employability skills for graduates . The average mean of communication skill mean is 2.58 and expected mean is at 3. The study showed a gap of -0.42 mean. non-verbal communication average mean is 2.46 and expected mean is at 3 and there is a gap of -0.54. Decision making skills average mean is 2.48 and expected mean is 3 and there is a gap of -0.52. problem solving skills average mean is 2.52 and expected mean is 3 and there is a gap of -0.48. Responsibility average mean is 2.06 expected mean is 2.50 and there is a gap of -0.44. Teamwork skills average mean is 1.99 expected mean 2.50 and there is a gap of -0.51. willingness to learn average mean is 1.79 expected mean is 2.50 and there is a gap of -0.71. The study proves there is a considerable gap of soft skills among the Engineering graduates.

Finding

English language has become a employability skills. The study clearly shows the state of lack of soft skills (employability skills) among the engineering graduates. One of the most demanded soft skills, verbal communication skills is at average. Lack of English language skills is really big concern as it's a minimum skills for entry level position . Decision making skills, problem solving skills, responsibility and teamwork is average. Willingness to learn is below average shows lack of initiatives on the part of candidates to learn new skills to make them employable. The study shows the lack of soft skills competency among the engineering graduates which is quite low for seeking employment.

Conclusion/Recommendations

The study reveals the lack of soft skills among the engineering graduates, due to which it's difficult for job seekers. Candidates who lack soft skills can not express themselves in English is at the mercy of Human resource manager, usually such candidates get's rejected. This creates a serious issues of unemployment due to skills gap among graduates. The research work has unravelled the loop holes, showed the incompetence of students to face real working environment due to lack of soft skills. Students lack job readiness, such situation arise because soft skills training are not imparted in classroom. It's on the part of every educational institution who wants to see success of students, needs to have close ties with industries expert to prepare students to face real working environment. Students need to be exposed to effective soft skills training which helps them in building strong set's skills. Soft skills has a paramount importance in not only for getting a job but also in overall development of students.⁽¹⁶⁾ Educational institution needs to motivate every students to sharpen their soft skills alongside academic.⁽¹⁷⁾ Through proper training and implementation of industrial based programs students can be equipped with required skills set's to make them employable.

Future scope for research

This study has brought into light the lack of soft skills among engineering students as well as highlighted the importance of soft skills. Due to growing importance of soft skills in various disciplines. This research can be replicated on a larger scale to know how soft skills varies demographically, areas such as urban and rural areas. Furthermore, there is a need for cross longitudinal research arise, as research can give a insight of industry specific soft skills requirements. soft skills varies from sector to sector, Indentification of sector specific skills set's requirement is very important. This can prepare well students with industry specific skills set's to face competitive job market.

Ethical Clearance : Nil

Source of Funding: Self

Conflict of interest: Nil

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Different Quality of Elderly Sleeping which Does Agents Regularly and not at the Welfare of Well Agung Kupang City

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Abstract

Background: Elderly is not a disease, a process that gradually results in cumulative changes, decreased immune system in the face of stimuli from inside and outside the body. Decreased endurance is characterized by decreased physical ability, decreased cardiovascular system, decreased respiratory system, decreased reproductive system, decreased muscular system, changes in the skin system, hair loss and this can inhibit the activities of the elderly. The higher the life expectancy, the greater the number of elderly people. This was followed by high health problems that exist in the elderly, one of which is sleep disorders which is more than half of the elderly people, often complaining of sleep disorders at night. Elderly exercise is one example of physical activity that can be done to improve the quality of sleep.

Objective: To determine the difference of sleep quality decline between the elderly who do regular and non-regular exercise. This study uses an experimental research group using a sample of 40 elderly.

Results: The elderly who have high quality sleep categories 11 people (27.5%) and elderly who have low sleep quality 29 people (72.5%) with an average of 47.8 and after regular exercise activities the number of elderly people who regularly reducing high sleep quality to 2 people (5%) and elderly who have low sleep quality of 35 people (95%) with an average of 22.2. The results of statistical tests in groups that do gymnastics irregularly and regularly by using statistical tests obtained p value 0,000.

Conclusion: This shows that there is an influence of elderly exercises on sleep quality in the elderly who do regular gymnastics and cannot improve sleep quality in the elderly.

Keywords: *Elderly, Elderly Gymnastics, Sleep Quality.*

Preliminary

Aging or aging is a condition that occurs in human life in three stages, namely childhood, adulthood and old age which cannot be avoided by every person. Elderly psychology is basically the study of psychological problems, behaviors and habits that occur when a person reaches the stage of age that enters the elderly category.

In the elderly there will be various setbacks in the organs of the body, therefore the elderly are very easily stressed (1).

Sleep quality is someone's satisfaction with his sleep experience that includes aspects of sleep initiation, maintaining sleep and quantity. Sleep quality and freshness when I wake up include quantitative aspects of sleep, such as sleep duration, time needed to be able to fall asleep, and frequency of awakening, and subjective aspects such as depth of sleep and extinction (2).

Changes in elderly sleep patterns are caused by changes in the central nervous system that affect sleep regulation (3). Changes in sleep quality in the elderly

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are caused by the physical ability of the elderly which decreases. Physical ability decreases due to decreased ability of organs in the body, such as the heart, lungs, and kidneys. Decreased organ capacity causes immune system and body immunity to be affected ⁽⁴⁾.

Factors that affect the sleep quality in the elderly, divided into 2 categories, they are internal and external factors. Internal factors include age, psychological condition, response to disease, etc. The external factors such as the environmental and lifestyle. The age factor is the most important factor that affected the quality of sleep⁽⁵⁾

In overcoming problems due to the changes experienced by the elderly, the health care needs to do sports, but what needs to be considered is that sports for the elderly have a rest than for young people. Type of exercise must also be considered and adjusted to the situation of the elderly. One of the good sports for the elderly is gymnastics ⁽⁶⁾.

Elderly exercise is a mild exercise and is easy to do but not burdensome to the elderly. This exercise will help the body become fit and fresh because it trains the bones to stay strong, encourage the heart to work optimally and help eliminate free radicals that roam in the body⁽⁷⁾. In his research stated that elderly exercise gives a significant influence on fitness physical. ⁽⁸⁾

This research is useful for the government, universities and also for the community to give insight into the importance of the elderly gymnastics.

Research Purposes

To find out the difference in psychological response can be seen from the decrease in sleep quality between the elderly who do regular and not regular exercise

Research Methodology

The research method used in this research is analytic observational with cross sectional design that is experimental research in order to study the dynamics of the correlation or influence between the dependent variable and the independent variable observed at the same time.⁽⁹⁾ The sample used in this study was all the elderly who were in UPT Budi Agung Welfare, Kupang City. elderly who can participate in gymnastics activities.

The total population is 80 people, and all of them are used as samples called total sampling. The analysis used in this study is univariate analysis and bivariate analysis

Results and Discussion

Characteristics of Respondents

Characteristics of respondents based on age, sex, education, religion and ethnic origin are explained in the following table 1

Table 1. characteristics of research respondents

Characteristics of respondents	Kategori	Amount People
Age	60-65	11 (27,5%)
	66-70	8 (20%)
	71-75	9 (22,5%)
	76-80	12 (30%)
Gender	Male	15 (37,5%)
	Women	25 (62,5%)
Education	No school	11 (27,5%)
	SD	22 (55%)
	Middle School	5 (12,5%)
	High School	1 (2,5%)
Religion	Higher education	1 (2,5%)
	Islamic	4 (10%)
	Christians	19 (47,5%)
Ethnic origin	Catholic	17 (42,5%)
	Timor	21 (52,5%)
	Rote	6 (15%)
	Sabu	4 (10%)
	Alor	3 (7,5%)
	Sumba	6 (15%)

Based on table 1, in addition, the characteristics of respondents by age can be seen that the age category of 60-65 years amounted to 11 people (27.5%), 66-70 years 8 people (20%), 71-75 9 people (22.5%) and 76-80 years 12 people (30%) can also be known that the characteristics of respondents by sex are 15 men (37.5%) and the sex of women is 25 people (62.5%), the

characteristics of respondents by group the highest level of education is the elementary level of 22 people (55%), not attending school of 11 people (27.5%), the junior high school level of 5 people (12.5%), while for the high school and D3 / S1 levels respectively 1 person each (2.5%). Characteristics of respondents based on groups of belief levels (Religion) the most are Christians amounting to 19 people (47.5%), Catholic religion totaling 17 people (42.5%), and Islamic religion totaling 4 people (10%), characteristics of respondents based on the most common ethnic origin is the plains of Timor totaling 21 people (52.5%), then Rote and Sumba 6 people (15%), methamphetamine 4 people (10%) and Alor 3 people (7.5%)

1. Univariate analysis

Differences in elderly psycho-physiological responses that do gymnastics regularly and are not explained in the table

Table 2. elderly who do exercise regularly and not.

Variable	Elderly who does irregular gymnastics			Elderly who does regular gymnastics		
	High	Low	Average	High	Low	Average
Sleep Quality	11 (27,5%)	29 (72,5%)	47.8	2 (5%)	38 (95%)	22.2

In this study divided into 2 categories: high and low listed in table 2 above, it can be seen the effect of elderly exercise on sleep quality regularly and not. Regular exercise category results show that the elderly who have high sleep quality categories of 11 people (27.5%) and elderly who have low sleep quality categories of 29 people (72.5%) with an average of 47.8 and the elderly who do gymnastics activities irregular number of elderly people who have high sleep quality 2 people (5%) and elderly who have low sleep quality 35 people (95%) with an average of 22.2.

2. Bivariate Analysis

Differences in sleep quality in the elderly who do regular and non-regular exercise

Table 3 sleep quality

Variable	Elderly who does irregular gymnastics		Elderly who does regular gymnastics		Value	Different p
	Average	Sd	Average	Sd		
Sleep quality	47,8	4,1	22,2	1,2	25.6	.000

The test results show there are differences in the average sleep quality of the elderly for the elderly who do regular exercise (47.8) and irregular elderly exercise (22.2). Different test results showed that the effect of elderly which performed regular and irregular gymnastic activities was significant or there was a relationship (p =

.000). This means that after giving gymnastics elderly for elderly people who do regular and irregular gymnastics experience changes in sleep quality (25.6).

Discussion

The results of research conducted on 40 respondents

obtained the results of the majority of respondents were female as many as 25 people (62.5%) and as many as 15 people (37.5%). This result also shows that the average number of respondents who become respondents is aged 60-80 years. Increasing age affects the decline from sleep periods. Changes in the quality of sleep in the elderly is caused by the physical ability of the elderly which decreases. Decreased organ capacity causes immune system and body immunity also influence.⁽¹⁰⁾

This study uses a non-experimental research group in order to study the dynamics of the correlation or influence between the dependent variable and the independent variable observed at the same time.

In this study the measurements were made before and after the elderly do gymnastics activities of the elderly who do gymnastic activities, both regularly and irregularly, with the results obtained in the elderly who do regular and irregular gymnastic activities to obtain insignificant results ($p = .000$). This shows the elderly who do regular gymnastic activities, their level of fitness becomes better, which gymnastics elderly can affect the quality of sleep in the elderly, according to researchers' observations this occurs due to respondents actually doing a series of gymnastics activities that are carried out actively with good, then the benefits of gymnastics directly obtained by respondents. These results indicate that the provision of elderly exercises affects the quality of sleep in the elderly with insomnia and H_0 rejected.

Elderly exercise is a mild exercise and is easy to do, not burdensome to the elderly. this exercise will help the body to stay in shape and stay fresh because it trains the bones to stay strong, encourage the heart to work optimally and help eliminate free radicals that roam in the body.⁽¹¹⁾

Conclusion

After conducting research on the differences in the psychological response of the elderly who do elderly gymnastics regularly and not at the Upt of Welfare Budi Agung Kupang City, it was found that 40 respondents found that most respondents were female as many as 25 people (62.5%) and as many as 15 men people (37.5%). This result also shows that the average number of respondents who become respondents is aged 60-80 years.

The results of statistical tests on groups that do gymnastics irregularly and regularly by using statistical tests obtained p value 0,000 for. This shows that there is an influence of elderly exercises on sleep quality in the elderly and can improve sleep quality in the elderly.

Suggestion

1. For the Budi Agung Welfare social home in Kupang City

It is hoped that this research can be used as evaluation material and input to help the quality of elderly sleep so that it remains normal by doing elderly gymnastics conducted at the Budi Agung Welfare Unit

2. Share nurses

It is expected that nurses can coordinate with the elderly program holders to be able to increase counseling evenly and thoroughly about the prevention and control of sleep quality in the elderly

3. For Educational Institutions

Can improve learning and knowledge about gymnastics that affect the quality of sleep in the elderly.

4. For Other Researchers

For further research it is hoped that this research can be used as additional information to develop further research on other benefits of elderly exercise such as overcoming increasing lung capacity and illustrating knowledge about elderly exercise.

Ethical Clearance: This study using human as research subjects, therefore, before obtaining the permission, the author submitted ethical clearance to Health Research Ethics Committee, Faculty of Medicine Nusa Cendana University. This research had been permitted with ethical approval recommendation number 86/UN15.16/KEPK/2019 dated october 07, 2019.

Source of Funding – Self

Conflict of Interest – Nil

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Physical Activity and Its Associated Factors among Adolescents in Secondary Schools in Northeast Peninsular Malaysia

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Abstract

Background: The World Health Organization has estimated that 81% of adolescents worldwide are not sufficiently physically active. This study aimed to determine the level of physical activity and its associated factors among adolescents in secondary schools in northeast Peninsular Malaysia.

Methods: A cross-sectional study was conducted that involved Form 1 and Form 2 students from six public secondary schools. The study included a multistage stratified cluster sampling and used the Malay version of the Physical Activity Questionnaire for Children and Body Image Contour Drawing Rating Scale. Data were analyzed by simple and multiple logistic regressions using IBM SPSS Statistics Version 22.

Results: The study involved a total of 603 students who had a response rate of 89.7%. About 53% of the students were physically inactive. Being female [adjusted OR (95% CI): 5.07 (3.57, 7.20)] and allocating time for studying [adjusted OR (95% CI): 0.86 (0.75, 0.98)] were associated with physical inactivity.

Conclusions: The majority of adolescents were physically inactive. To achieve a higher level of physical activity, intervention programs must consider the sex of adolescents and the amount of time they allocate for activities. Objective assessment of physical activity using pedometer or accelerometer is recommended.

Key words: adolescent; body image; body mass index; exercise, schools.

Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that require the expenditure of energy¹. The World Health Organization (WHO) suggests that children and adolescents aged 5 to 17 years old need moderate to high intensity physical activity at least 60 minutes per day. In 2010, WHO estimated that

81% of adolescents aged 11 to 17 years old worldwide were not sufficiently physically active². In a National Health and Morbidity Survey, the national prevalence of obesity among Malaysian children under 18 years old had risen, almost doubling, from 6.1%³ to 11.9%⁴.

Physical inactivity in childhood directly relates to obesity and chronic diseases that can occur later in life⁵. It appears to have an impact comparable to smoking or obesity⁶. The WHO has targeted a reduction of 10% of physical inactivity by 2025⁷. Many factors are associated with physical inactivity, such as age, sex, weight, screen time, sedentary lifestyle (including screen time), economic status, and access to transportation, sports, and recreation facilities⁸. Some of these factors can contribute to difficult and vicious cycle problems.

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The purpose of this study was to determine the prevalence of physical activity and its associated factors among adolescent students in secondary schools in Terengganu, Malaysia. Physical activity is defined as any body movement that requires energy expenditure.

Materials and Method

This cross-sectional study included secondary school students from Form 1 (aged 13 years old) and Form 2 (aged 14 years old). It excluded students with a chronic physical disability who require help for daily activities. A multistage stratified cluster sampling was applied across 130 public secondary schools in Terengganu, Malaysia. The schools were stratified into urban ($n = 46$) and rural ($n = 84$) schools; three schools were randomly selected from each group. In each school, three classes were randomly selected from both Form 1 and Form 2. In each class, all students were selected. The sample size was calculated based on a single proportion formula. The prevalence of physical inactivity among adolescents in Malaysia was 57%⁹. After considering the precision of 0.05, cluster effect of 1.5, and non-response rate of 20%, the required sample size was 679 students.

The study involved a case report form to obtain sociodemographic and general information, a Contour Drawing Rating Scale, and a questionnaire about physical activity for older children. An anthropometry measurement for BMI was taken. The Contour Drawing Rating Scale helps to assess body image perception¹⁰. Body image perception is a person's perceptions, thoughts, and feelings about his or her body¹¹.

The PAQ-C is a self-administrated, 7-day recall instrument with nine items to assess the general levels of physical activity¹². Each item was scored on a five-point scale, with scores ranging from 9 to 45. The final scores were categorized into low, moderate and high physical activity¹³. The PAQ-C has the Cronbach's alpha, ranging from 0.72 to 0.85¹⁴. The Cronbach's alpha for the Malay version was 0.79¹⁵. Physically inactive refers to low physical activity, and physically active refers to moderate and high physical activity⁹.

Students were briefed on the study. Assent and parental consent forms were distributed prior to the date of data collection. Self-administered questionnaires were distributed and body height and weight measurements were taken. The data were analyzed using IBM SPSS Statistics Version 22. Simple and multiple logistic regression analyses were performed.

Results

A total of 603 responded giving a response rate of 89.7%. Table 1 shows the sociodemographic and general information of the 603 study participants. The prevalence of physical inactivity among secondary school students in Terengganu was 52.9% ($n = 319$).

Simple logistic regression showed that family income, study time, school type, sex, and body image perception (desire to reduce weight) have a P value of <0.25 (Table 2). Multiple logistic regression analysis shows that sex and study time were significantly associated with physical inactivity (Table 3). Being female had 5.07 odds of physical inactivity compared to male. For every one hour increase in study time, there were 0.86 odds in physical inactivity.

Table 1. Characteristic of study participants (n= 603)

Variable	Physically inactive (n=319)		Physically active (n=284)	
	Mean (SDa)	n (%)	Mean (SDa)	n (%)
Family income (RM)	1888 (2021)		2320 (3087)	
Screen time (hour/day)	2.68 (2.43)		2.81 (2.45)	
Study time (hour/day)	1.85 (1.31)		2.11 (1.30)	
Type of school				
Urban		151 (47.3)		148 (52.1)
Rural		168 (52.7)		136 (47.9)
Sex				
Male		88 (27.6)		186 (65.5)
Female		231 (72.4)		98 (34.5)
Body mass index				
Normal		215 (67.4)		188 (66.2)
Underweight		30 (9.4)		30 (10.6)
Overweight		46 (14.4)		37 (13.0)
Obese		28 (8.8)		29 (10.2)
Body weight perception				
Normal		218 (68.3)		198 (69.7)
Underweight		37 (11.6)		30 (10.6)
Overweight		55 (17.2)		47 (16.5)
Obese		9 (2.8)		9 (3.2)
Body image perception				
Satisfaction		28 (8.8)		42 (14.8)
Desire to reduce weight		194 (60.8)		134 (47.2)
Desire to increase weight		97 (30.4)		108 (38.0)

RM = Malaysian Ringgit

^aStandard deviation**Table 2. Associated factors of physical inactivity by simple logistic regression**

Variables	Regression coefficient	Crude Odds Ratio (95% CI)	Wald statistic	P value
Family income (RM)	0.00	1.00 (1.00, 1.00)	4.03	0.045
Screen time (hour/day)	-0.02	0.98 (0.92, 1.04)	0.47	0.492
Study time (hour/day)	-0.14	0.87 (0.77, 0.98)	7.23	0.007
Type of school				
Urban		1		
Rural	0.19	1.21 (0.88, 1.67)	1.37	0.242
Sex				
Male		1		
Female	1.61	4.98 (3.52, 7.05)	82.46	<0.001
Body mass index				
Normal		1		
Underweight	-0.13	0.87 (0.51, 1.50)	0.24	0.628
Overweight	0.08	1.09 (0.68, 1.75)	0.12	0.730
Obese	-0.17	0.84 (0.49, 1.47)	0.36	0.550
Body weight perception				
Normal		1		
Underweight	0.11	1.12 (0.67, 1.88)	0.18	0.668
Overweight	0.06	1.06 (0.69, 1.64)	0.08	0.783
Obese	-0.10	0.91 (0.35, 2.33)	0.04	0.842
Body image perception				
Satisfy		1		
Want to reduce weight	0.78	2.17 (1.28, 3.68)	8.34	0.004
Want to increase weight	0.30	1.35 (0.78, 2.34)	1.12	0.289

Table 3. Associated factors of physical inactivity by multiple logistic regression

Variables	Regression coefficient	Adjusted Odds Ratio (95% CI)	Wald statistic	P value
Study time (hour/day)	-0.16	0.86 (0.75, 0.98)	5.00	0.025
Sex				
Male		1		
Female	1.62	5.07 (3.57, 7.20)	82.44	<0.001

Discussion

Our findings showed that the proportion of physical inactivity among younger adolescents aged 13 and 14 years old in Terengganu was 52.9%. This finding was comparable with a study that discovered 57.3% of Malaysian adolescents aged 10 to 17 years old were physically inactive⁹. However, a Global School-based Student Health Survey that was done in Malaysia found that 47.4% of students aged 13 to 17 years spent three or more hours sitting on a typical day¹⁶. It is difficult to compare these two studies because they used different research tools.

In this study, female students were five times more likely to be physically inactive compared to male students. The proportion of being physically active in the five or more days during the previous week was significantly higher among males (29.5%) compared to females (16.8%) in school children aged 13 to 17 years old in Terengganu¹⁶. Because most female students experience secondary sexual characteristic changes during this age, they might not feel comfortable being physically active. This is consistent with a study that found physical activity declined after menarche¹⁷.

A study in Borneo found that male students have a mean of 600 steps more than female students, which might reflect that female students are more physically inactive¹⁸. The Multidisciplinary Lifestyle of Our Kids project in Australia found that girls were 19% less active and had 1,940 fewer steps per day than boys¹⁹. Lower physical activity among girls was associated with

weaker influences at school and in the family and lower participation in extracurricular sports¹⁹. A review of 29 articles revealed that, on average, females participate in physical activity at lower rates than males, and they found that self-efficacy, social support, and motivation are empirically substantiated factors that impact their physical activities²⁰.

With the advance in technology and internet coverage, adolescents are prone to spend more time on screen-related activities. Compared to previous years, adolescents only had television, where today, adolescents might own smartphones or tablets, giving them more access to social media²¹. Some adolescents might also have a video game console at home. Increasing the total usage of time for screen-related activities might affect the time for physical activity as demonstrated by a Brazilian study, which showed that the proportion of physical inactivity among adolescents increased because of higher screen time²². In Malaysia, children aged 7 to 12 years spent an average of 3.1 hours per day on screen-based activities, including television watching, video gaming, and computer use²³.

This study is not without limitations. First, the PAQ-C did not prompt participants to indicate a specific time allocation for physical activity nor specific caloric expenditure and intensity for each activity. Second, a recall bias can be introduced on the estimated duration for screen time and study time. Third, a selection bias can be introduced because students from the same cluster might share similar characteristics.

In conclusion, this study showed a high proportion of physical inactivity among adolescents in secondary schools in Terengganu, Malaysia. Two factors increased the risk for physical inactivity: being female and spending less time on studying. For future studies, we recommend objective assessment of physical activity, such as, using a pedometer or accelerometer, and including both early and late stages of adolescents.

Ethical Clearance: Taken from Research Ethics Committee (Human) Universiti Sains Malaysia (USM/JEPeM/15100309) and the Ministry of Education in Malaysia.

BMI: body mass index; PAQ-C: Physical Activity Questionnaire for Older Children; WHO: World Health Organization.

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Biochemical and Hematological Status in Rice farmers with Chronic Pesticide Exposure, Suphan Buri, Thailand

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Abstract

Suphan Buri is located in central river plain of Thailand, which has enough water supplies for rice cultivation area in two or three growing cycles. Thus, farmers may expose to pesticides more frequent rather than other area and may become as chronic pesticide exposure. Aim of this study was to determine biochemical and hematological of rice farmers compared with controls who living nearby agricultural area. Subjects were divided to rice farmers (N = 50) and controls (N = 50). Individual data, pesticide-exposure status and relating symptoms were documented before blood collection. Serum samples were analyzed for serum cholinesterase (SChE) activity, liver function test (LFT) and kidney function test (KFT). Each EDTA-whole blood was determined for complete blood count (CBC). SChE activity was screened and confirmed by paper test and automatic analyzer, respectively. LFT, KFT and CBC were run by automatic analyzers. Results were represented in descriptive data and difference of LFT and hematological status between two groups were evaluated by independent *t*-test ($p < 0.05$). 60% of rice farmers were used pesticide over 10 years; and rate of pesticide exposure was mainly for 1-2 time/week. Means of SChE level of both groups were within reference value and significantly different ($p = 0.033$). Mean corpuscular hemoglobin (MCH), mean corpuscular volume (MCV) and mean corpuscular hemoglobin concentration (MCHC) values of rice farmers were significantly lower ($p = 0.045$, 0.04 and 0.03, respectively). SChE activity and biochemical parameters in rice farmers were within reference value; therefore disturbance of hematological status, such as anemia was appeared.

Keywords: blood indices, chronic pesticide exposure, kidney function test, liver function test, serum cholinesterase, complete blood count

Introduction

Pesticides are broadly utilized for pest and pest-induced disease controls, especially in crop cultivation

and vector-borne diseases control for public health work [1]. In developing countries were used pesticide about 20% of the world and Thailand was the third rank of pesticide usages in Asia-Pacific region [2]. The reported cases of the toxic effects of pesticide are predominantly in the Central region of Thailand. The numbers of cases were usually increased during the growing season of many crops in rainy season (May - August) each year, and it was found mainly in farmers and farm workers [3]. Central of Thailand is on intensively cultivated rice crop land when water conditions allow had been occurred [4]. Suphan Buri province is located in central plain

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and has enough water supplies in this cultivation area, two or three rice growing cycles. Thus, farmers may expose to pesticides more frequent rather than other area also. Agricultural workers in Suphan Buri had reported using several brands of insecticides, plant hormones, and chemicals for “control of plant diseases”. Most of active insecticide substances in commercial products are abamectin, chlorpyrifos, carbofuran, and cypermethrin [3, 5].

Various effects of chronic pesticide exposure are cancer, birth defects, reproductive disorders, neurodegenerative, cardiovascular and respiratory diseases, developmental disorders, metabolic disorders, chronic renal disorders or autoimmune diseases [6]. According by epidemiologic data, pesticides are effect on enzymes, which are responsible for liver function, blood cell characteristics and other biochemical pathways in persons who are pesticide expose and have occupationally diseases [7-9]. Biological effects of pesticide are involved by oxidative stress, epigenetic controls and gut microbiological digestion and modulation of genetic polymorphisms [10, 11]. Light occupational exposure to pesticides is associated with hematological abnormalities [12]. However, prolong and intensive exposure may associate to any liver, kidney, or hematological disorders. This study was aimed to determine biochemical and hematological parameters in rice farmers, which were intensively pesticide exposed and habituated in rice cultivation area of Suphan Buri, Thailand. The finding may indicate the association between pesticide exposure and early subtle and sub-clinical changes in biochemical and hematological parameters.

Materials and Methods

Subject recruitment and data collection

The study was conducted in U-Thong district, Suphan Buri province, about 150 km from West of Bangkok, where rice is main harvesting product. Outsource pesticide sprayers were common finding in rice field. Cross-sectional study was carried out from June 2019 to February 2020 on data had collected from annually health service program by health promoting hospital. This study was recruited 100 respondents included 1) 50 rice farmers (risk group) were aged 18-65 yr who lived in this area, which had handle pesticide regularly

or work in paddy field at least three years or more 2) The control group was included 50 respondents who lived nearby field area and listed in house registration, had non-related professional for farm workers. Respondents with a history of serious conditions, such as, liver diseases, severe cardiovascular diseases, cancer were excluded. Questionnaire interviewing and blood collection were conducted by well-trained research assistants and medical technologists, respectively. Gathered information concerning of long-term pesticide exposure was recorded from questionnaires by personnel interviewing. The sample size was estimated using the single proportion formula with 95% confidence interval and based on percentage of abnormal SChE level in previous study [13]. The Ethics Committee of Thammasat University was approved this research protocol (COA No. 084/2562). The director of U-Thong district & health promoting hospital, Suphan Buri province gave permission to conduct on this study. All participants gave informed consented.

Blood collection, preparation and storage

Each 5 ml of blood sample was obtained by venipuncture from median cubital vein during morning (7-9 a.m.); and drawn into clotting blood and EDTA tubes for 3 ml and 2 ml, respectively. Clotting blood tube was further centrifuged; and serum was separated within 2 h after phlebotomy and stored at -20 °C [14] for SChE activity, LFT and KFT analysis. Whole blood contained in EDTA tubes were prepared for CBC test.

Evaluation of biochemical and hematological parameters

SChE screening and confirming of SChE level was done by paper test and automatic analyzer, respectively. The paper test kit was developed and manufactured by Government Pharmaceutical Organization (GPO), Thailand. The efficiency of test including sensitivity, specificity and positive predictive values were 77, 90 and 85%, respectively [15]. The quantitative analysis of SChE activity, LFT and KFT was conducted by automatic analyzer, COBAS c501 (Roche-diagnostics, Rotkreuz, Switzerland), which were performed in certified clinical laboratories. All hematologic parameters in CBC were analyzed by Celltac E MEK-7222 (Nihon Kohden, Tomioka, Japan). Interpretation of biochemical and hematological parameters was done by reference value

comparing according by instruction of manufacturer and the Clinical and Laboratory Standards Institute (CLSI).

Statistical Analysis

Descriptive data was explained by using mean and standard deviation; and frequency. The Kolmogorov-Smirnov test was used to test for normal distribution of data. Independent *t*-test tested for differences in the biochemical and hematological parameters between rice farmers and controls. The statistical significance was judged at $p < 0.05$. SPSS 21.0 software was used for statistical analysis (SPSS, Chicago, Illinois, USA).

Results and Discussion

Chronic pesticide exposure in rice farmers

No statistical significance different between rice farmers and controls for gender and risked behavior, such as alcoholic consumption. All of rice farmers were long-term pesticide exposure and 60% of rice farmers were used pesticide over 10 years; and rate of pesticide exposure was mainly for 1-2 time/week. The related pesticide used symptoms were rarely occurred and almost of them had health education for awareness of pesticide uses. However, unexpected finding may due to unspecific symptoms, imprecisely explain by personal interviewing and tolerance of frequent exposed farmers. Means of SChE level were significantly different between rice farmers and controls ($p = 0.033$), however, there were within reference value (5,500-13,000 U/L). Some of rice farmers had SChE level lower than reference value (data not show), which was implied that SChE may not be a good marker for quantifying exposure to pesticide among sprayers, especially during spraying season. In previous study, agriculturists can be exposed to pesticides divided into sprayers, agriculturists and other professions, however, the SChE levels among them were not significantly difference and level was still within reference range^[16]. Most of studies on Thai pesticide exposure had reported exposure of

single type of pesticide; however, mixed pesticide uses are more common for multi-crop cultivation. Thus, screening of other biomarkers for evaluation of long-term pesticide exposure rather than serum cholinesterase such as, alkyl phosphate metabolites (DAPs), urinary 3-phenoxybenzoic acid (3-PBA) and urinary glyphosate, is still necessary for public provider^[17].

Biochemical and hematological parameters in rice farmers

Biochemical parameters were not significantly different between rice farmers and controls; and there were within reference values (Table 1). Mean corpuscular hemoglobin (MCH), mean corpuscular volume (MCV) and mean corpuscular hemoglobin concentration (MCHC) values of rice farmers were significantly lower than controls ($p = 0.045$, 0.04 and 0.03, respectively); and MCHC in rice farmers was lower than reference value (Table 2). Subclinical change in hematological parameter is little attention on pesticide exposure rather than cancer, neurological disorders, epigenetic interaction, oxidative stress and gene polymorphism^[10-12]. However, hematotoxicity is biomarker and can be indicate occupational exposure along with genotoxicity and oxidative stress occurrence^[18]. In this study, the mean of MCHC was lower in pesticide sprayers than reference range. Low MCHC was represented mild anemia may have been caused by 1) anemia in some elderly farmers arising from a condition such as chronic blood loss and/or malnutrition and 2) the sub-chronic pesticide exposure especially OPs may induced anemia in animal models^[19, 20]. In previous studies, abnormal blood indices had finding and the impairment of liver and kidney functions had apparent in pesticide sprayers and agricultural workers^[21-24]. Lifetime and high season pesticide use are also associated with lower number of RBC and WBC, particularly lymphocyte and eosinophil^[25].

Table 1: Liver and kidney function tests between rice farmers and controls

Group/ parameter	Liver function test							Kidney function test	
	Total protein (g/dL)	Albumin (g/dL)	Total bilirulin (mg/dL)	Direct bilirulin (mg/dL)	AST (U/L)	ALT (U/L)	ALP (U/L)	BUN (mg/dL)	Creatinine (mg/dL)
Rice farmer	7.29 ± 0.22	4.50 ± 0.04	0.36 ± 0.02	0.13 ± 0.03	23.0 ± 1.2	21.7 ± 2.0	99.9 ± 3.5	10.8 ± 4.6	0.85 ± 0.1
Control	7.45 ± 0.16	4.43 ± 0.04	0.36 ± 0.04	0.11 ± 0.01	23.6 ± 1.3	24.6 ± 1.9	101.2 ± 4.0	9.3 ± 3.5	0.71 ± 0.1
Reference range	6.60-8.70	3.50-5.50	0.30-1.20	0.00-0.50	0-37.0	0-40.0	53-128	5.0-23.0	0.5-1.52
p-value	0.552	0.282	0.964	0.485	0.744	0.308	0.797	0.561	0.152

AST = aspartate aminotransferase, ALT = alanine aminotransferase, ALP = alkaline phosphatase, BUN = blood urea nitrogen

Table 2: Hematological parameters in rice farmers and controls *

Group/ parameter	RBC (10 ⁶ /mm ³)	Hct (%)	Hb (g/dL)	MCV (fL)	MCH (pg)	MCHC (g/dL)	RDW (%)	WBC (10 ³ /mm ³)	Plt (10 ³ /mm ³)
Rice farmer	5.16 ± 0.1	41.8 ± 0.8	13.5 ± 0.3	83.4 ± 1.3	26.0 ± 0.7	30.3 ± 0.2	15.3 ± 0.6	5,895 ± 265	264,421 ± 9,627
Control	5.13 ± 0.1	41.8 ± 1.2	14.5 ± 0.6	88.4 ± 1.6	27.8 ± 0.6	31.7 ± 0.7	15.0 ± 0.5	5,699 ± 241	247,802 ± 10,424
Reference range	4.0-5.5	M = 35-49 F = 32-42	M=13-18 F=12-16	80-100	23-33	31-37	12-16	4,000-10,000	140,000-400,000
p-value	0.84	0.984	0.154	0.045	0.04	0.03	0.757	0.587	0.244

WBC = white blood cell, RBC = red blood cell count, Hct = hematocrit, Hb = hemoglobin, MCV = mean corpuscular volume,

MCH = mean corpuscular hemoglobin, MCHC = mean corpuscular hemoglobin concentration, RDW = RBC distribution width,

Plt = platelet count

* RBC morphology and WBC differentiation with microscopic examination were not shown

Conclusion

Rice farmers with frequent and prolonged exposure in this study area were normal SChE and biochemical parameters; therefore disturbance of hematological status, such as anemia was appeared. Blood indices may use as biomarkers to evaluate early subtle and sub-clinical changes in chronic pesticide exposure.

Acknowledgement: We would like to sincerely thank medical staffs from U-Thong district & health promoting hospital for local public relation and research assistants providing.

Source of Funding: Suan Sunandha Rajabhat University, Bangkok, Thailand.

Ethical Clearance: Ethics Committee of Thammasat University was approved this research protocol.

Conflicts of Interest: The authors confirm that there are no conflicts of interest.

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Effects of Food Fit for Fun Program with Social Media Used on Health Literacy and Obesity Prevention Behaviors among Senior-Primary School Students, in Nakhon Ratchasima Province Thailand

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Abstract

Background: Childhood obesity has become more prevalent all over the globe. In Thailand, the highest prevalence rate of childhood obesity has been found among primary school students in Northeastern (9.9%), which still exceeds 7% recommended by the WHO.

Objective: This study aimed to assess the effectiveness of Food Fit for Fun program with social media used on health literacy and obesity prevention behaviors among senior-primary school students in Nakhon Ratchasima Province, Thailand.

Methods: A quasi-experimental was conducted. An experimental and a control group each with 34 participants. A 12-week program was implemented with Health Literacy on dietary and physical activities and social media were used for communication and support. Analysis of the data was performed using t-test while a mean difference and 95%CI were used for determining statistical significance.

Results: The senior-primary school children in the experimental group improved their mean difference on health literacy in preventing obesity (10.18; 95% CI: 7.11 to 13.24, p-value <0.001) and dietary and physical activity behaviors (13.44; 95% CI: 6.11 to 20.77, p-value <0.001), compared to the control group. After interventions, the experimental group had a statistically significantly lower mean score on nutritional status (weight for height) (0.26; 95% CI: 0.05 to 0.59, p-value <0.05) and fat percentage (1.71; 95% CI: 0.19 to 3.22, p-value <0.05) than the comparison group.

Conclusions: This study provided sustainable evidence on effectiveness of Food Fit for Fun program with the use of social media. This outcome showed that it could improve health literacy in preventing obesity and behavioral modification as well as reduce weight and fat percentage in children.

Key words: *Childhood Obesity, Health Literacy, Behavioral Modification.*

Introduction

Nutrition is directly related to a person's health status. It is one of the indicators which show the country's progress. Nevertheless, the physical condition of children receiving more nutrients, coupled with having little physical activity (PA), will cause overnutrition among those children.¹ The prevalence of childhood obesity is increasing worldwide, including Thailand. The prevalence of obesity in primary

schools rose from 8.8% to 9.9% in just two years.² As pointed out in Thai National Health Examination Survey, NHES V, during the past 13 years until 2014, on the prevalence of obesity and being overweight in children, the weight of children aged above 9 years gradually increased with the mean of 2 kilograms.^{3,4} The problem of childhood obesity appears to have expanded into larger urban areas and is frequently found in the northeast region^{5,6}, the prevalence of being obesity among students in Nakhon

Ratchasima province is 15.7% which is higher than 10.0 regarded as a standard range set by Ministry of Public Health (MPH).^{6,7}

Obese children tend to become obese adults and are associated with chronic diseases, including type 2 diabetes, hypertension, cardiovascular diseases, and certain forms of cancer.^{8,9} Although the origin of obesity is complex, it relates to diet and PA,¹⁰ e.g. the imbalance of the energy received and a rise in sedentary lifestyles, including a lack of health literacy (HL).¹¹⁻¹³

Thailand added HL as the realization of individuals' knowledge, skills as well as confidence in practicing beneficial behavior.¹⁴ Overall, HL was positively correlated with obesity prevention behaviors; similarly, decision skills were positively correlated with food consumption behavior while self-management skills and media literacy were positively correlated with exercise behavior,¹⁵⁻¹⁷ and it can be easily triggered by environmental conditions and family and friend support.¹⁸

HL among overweight children, therefore, is the key to understanding the obesity prevention behaviors. However, there are limited studies designed to apply the HL with the use of social media for connecting with children in the network in communicating, participating, and providing social support in decision making aiming towards weight management goals. Therefore, the present study aimed to evaluate the effectiveness of Food Fit for Fun program based on the HL framework¹⁹ with the use of social media among senior-primary school students in Nakhon Ratchasima Province Thailand.

Materials and Method

Study design

The study was a quasi-experimental study, applying a two-group pre-test post-test design in Northeastern region, Thailand in the year 2020 (Nakhon Ratchasima province was selected because of its high prevalence of overweight primary school children).⁷

A simple random technique was applied to choose the experimental and control groups. The sample size required to ensure a minimum predictive power of 90% with a 0.05 probability of type I error was determined to be 34 obese children per group. The sample size calculation was taken from Chachumpa and Banchonhattakit (2017).²⁰

Inclusion criteria were obese students according to the nutritional status were assessed by measuring weight and height and evaluated by the standard growth curve (z score greater than +1.5 SD) and student had previously been diagnosed with chronic asthma, psychiatric disorders and disability were excluded. Both parents and children provided their written consent.

Procedure

Food Fit for Fun Program: The activities in this program were modified from the Chopa and Chipa Game of MPH in Thailand.²¹

1) Cognitive skill: main activities of nutrition and PA education were knowledge enhancement, e.g. obesity assessment, the traffic lights food and PA.

2) Access skill: promote children's ability to gain access to, understand and use information maintain weight.

3) Communication skill: develop an online set of training modules and a Line group to teach, communication and support children's understanding of obesity prevention.

4) Self-management skill: based on this guideline, the Chopa and Chipa Game for primary school children has achieved an improvement in physical fitness (3 times/wk.) and use of smartphone applications for daily calorie control.

5) Media literacy skill: advertisement analysis and group discussions oriented to participants' preference of media.

6) Decision skill: role play to prevent obesity and reduce childhood obesity.

Most activities were performed at school by a researcher and a research assistant. The cooks' roles involved preparing and supporting healthy food. In addition, social media were used for communication, information support, encouragement, and compliments.

Measurement tool

To assess children's HL to prevent obesity, six domains were adapted from MPH in Thailand,²² namely cognitive, access, communication, decision, self-management,

media literacy skill, dietary and PA behaviors. The questionnaire consisted of 67 items. Possible responses to cognitive items were categorized as dichotomous (Yes/No), and other items ranged from 1=never to 5=usually. The HL was interpreted as 'inadequate', >80 to 108 pts. as 'problematic', and >108 to 135 pts. as 'adequate'. The questionnaire was validated by experts and tested for its reliability (0.87).

A stadiometer was used to measure height and weight. Both height and weight were assessing the nutritional status by standard growth curve. Body fat percentage was calculated using the Body Composition Analyzer (OMRON HBF-222T). All investigators were blinded, and the instrument was calibrated to ensure accurate scale measurement for both the pretest and posttest.

Statistical Analysis

T-test was used to compare the effects of the Food Fit for Fun Program between groups. All analyses were performed by using Stata version 10.0 (Stata Corp, College Station, TX). All test statistics with a p-value less than 0.05 were deemed statistically significant.

Result

Demographic Characteristics

There were no differences in the average age between

the experimental group (10.5 ±0.93 y) the control group (10.5 ±0.90 y). The gender level distribution was similar, more than half of both group of them were female (the experimental group was made up of 61.8% of female students and the control group was of 58.8%). There were no differences of the average fat percentage between the experimental group (28.4 ±2.96 years) and the control group (29.0 ±3.03 years). More than three-quarters of both groups' nutritional status was +2 SD (accounting for 88.3% of the experimental group and 85.3% of the control group). No statistically significant differences were found between the two groups in any of the demographic characteristics measured at the baseline ($p > 0.05$) (Table 1).

The result from pair t-test showed strongly higher changes of six domains related to HL to prevent obesity in the experimental group (21.85; 95% CI: 19.27 to 24.44, p-value <0.001), and those of dietary and PA behaviors were observed in the experimental group (16.59; 95% CI: 10.84 to 22.34, p-value <0.001), compared with their pre-intervention scores of HL. Nutritional status also demonstrated significantly greater changes in the experimental group, compared to the pre-intervention status (0.12; 95% CI: 0.01 to 0.23, p-value <0.05), and significantly higher changes in fat percentage were present in the experimental group after the 12 weeks of intervention (1.56; 95% CI: 1.30 to 1.90, p-value <0.001) (Table 2).

Table 1. Baseline characteristics

Characteristics	Experimental group (n=34)	Control group (n=34)
Age (y)	10.5±0.931	10.5±0.90
Gender		
Girls	21 (61.8) 2	20 (58.8)
Boys	13 (38.2)	14 (41.2)
Nutritional status (WFH)		
Overweight	1 (2.9)	1 (2.9)
Obese and morbidly	30 (88.3)	29 (85.3)
obese	3 (8.8)	4 (11.8)
Body fat percentage	28.4±2.96	29.0±3.03

Table 1. Baseline characteristics

Pocket money for school		
< 50 baths ³	6 (17.7)	9 (26.4)
50 – 100 baths	27 (79.4)	21 (61.8)
> 100 baths	1 (2.9)	4 (11.8)
Students living		
Parent	26 (76.5)	24 (70.6)
Grandparents	6 (17.7)	5 (14.7)
Uncle/Aunt	2 (5.8)	5 (14.7)
Parental occupation		
Government agencies	10 (29.4)	10 (29.4)
Self-employed	9 (26.5)	7 (20.6)
Agriculturist	7 (20.6)	6 (17.7)
Employee	8 (23.5)	11 (32.3)
Parental education		
Non education	4 (11.8)	4 (11.8)
Primary School	3 (8.8)	2 (5.8)
Junior High School	4 (11.8)	2 (5.8)
Senior High School	5 (14.7)	4 (11.8)
Diploma	6 (17.6)	4 (11.8)
Bachelor's degrees	9 (26.5)	10 (29.4)
Bachelor's degree or higher	3 (8.8)	8 (23.6)
Family history of obesity ⁴		
Yes	12 (35.3)	15 (44.1)
No	22 (64.7)	19 (55.9)

¹ $\bar{x} \pm SD$, ² n; percentage ³ 1 bath = US\$0.03 at the time the questionnaire was completed.

⁴ Family refers to parents, grandparents, and parents' siblings.

Table 2. Mean difference within group using Pair t-test

Health Literacy to prevent obesity	Experimental group (n=34)					Control group (n=34)				
	Base line	After 12 weeks	Mean diff	95%CI	p-value	Base line	After 12 weeks	Mean diff	95%CI	p-value
Health Literacy	86.85 (0.99)	108.71 (1.26)	21.85	19.27 to 24.44	< 0.001*	88.73 (1.01)	98.53 (0.88)	9.79	7.83 to 11.76	< 0.001*
Dietary and PA behaviors	60.68 (2.79)	77.26 (2.02)	16.59	10.84 to 22.34	< 0.001*	64.12 (2.07)	63.82 (3.06)	0.29	-8.02 to 8.61	0.943
Nutritional status	2.06 (0.06)	1.94 (0.06)	0.12	0.01 to 0.23	<0.05*	2.09 (0.06)	2.21 (0.09)	0.12	-0.09 to 0.32	0.254
Fat percentage	28.38 (0.51)	26.82 (0.53)	1.56	1.30 to 1.90	< 0.001*	29.02 (0.52)	28.52 (0.54)	0.49	0.32 to 0.67	< 0.001*

* A p-value less than 0.05 was deemed statistically significant.

Table 3. Mean difference between group using Independent t-test

Health Literacy to prevent obesity	Baseline					After intervention 12 weeks				
	Exp. group	Con. group	Mean diff	95%CI	p-value	Exp. group	Con. group	Mean diff	95%CI	p-value
Health Literacy	86.85 (0.99)	88.73 (1.01)	1.88	-0.94 to 4.71	0.188	108.71 (1.26)	98.53 (0.88)	10.18	7.11 to 13.24	< 0.001*
Dietary and PA behaviors	60.68 (2.79)	64.12 (2.07)	3.44	-3.50 to 10.38	0.326	77.26 (2.02)	63.82 (3.06)	13.44	6.11 to 20.77	< 0.001*
Nutritional status	2.06 (0.06)	2.09 (0.06)	0.03	-0.15 to 0.20	0.738	1.94 (0.06)	2.21 (0.09)	0.26	0.05 to 0.59	<0.05*
Fat percentage	28.38 (0.51)	29.02 (0.52)	0.64	-0.81 to 2.09	0.381	26.82 (0.53)	28.52 (0.54)	1.71	0.19 to 3.22	<0.05*

* A p-value less than 0.05 was deemed statistically significant.

After interventions, the result from independent t-test showed that compared with the control group, the experimental group displayed the improvement in their mean differences on health literacy in preventing obesity (10.18; 95% CI: 7.11 to 13.24, p-value <0.001), dietary and PA behaviors (13.44; 95% CI: 6.11 to 20.77, p-value <0.001). A significant decrease in mean differences in nutritional status was discovered in the experimental group compared to the

control group over the duration of 12 weeks of intervention (0.26; 95% CI: 0.05 to 0.59, p-value <0.05). Similarly, there were statistically significant differences in mean differences on fat percentage reduction between the experimental and control groups (1.71; 95% CI: 0.19 to 3.22, p-value <0.05) (Table 3).

Discussions

Evidence suggests that a HL approach is the most

effective strategy to promote lifestyle changes and confirms that HL is the key to ensuring adherence to the healthy path of obesity management. In line with previous evidence, the results of this study seem to be able to show how an HL approach is effective in children, where a significant decrease in body weight and in fat percentage was observed as well as improvement of the nutritional and PA.

It can be noticed that, there is a statistically significant difference in the post-intervention mean score of HL to prevent obesity between two groups in terms of the levels of HL immediately after the intervention. Regarding the results of this study, the training program had a positive impact on the improvement of HL. The various aspects of PA and its benefit were evaluated in both the experimental and control groups, and the results are consistent with the literature.²³ In consistence with the present study, Sarittha S. in 2018 determined a significant increment of HL after the intervention.²⁴ The effect of training programs on the level of health literacy in children with obesity and demonstrated that almost all them had adequate literacy after the training sessions.²⁵ Similarly, the previous literature showed the impact of health literacy-based education on the lifestyle entailing diet and exercise on obese children.^{13,15-17}

The HL approach structured in an intervention model can deliver better outcomes than the isolated intervention. This result is in conformity with other studies which found that an obesity prevention intervention improved the body fat percentage of the participants. The activities in this intervention consisted of nutrition and fitness which positively affected BMI. Therefore, further studies within different age, including applying the study design to enhance HL, are to improve weight loss strategies to cover all ages and ensure sustainability.

Conclusions

The Food Fit for Fun program with social media use can improve HL for preventing obesity and behavioral modification in overweight or obese children.

Acknowledgements

We would like to express our gratitude to Graduate School, Khon Kaen University in Thailand. Special

thanks are expressed to all the participants for their full cooperation and dedication.

Ethical Clearance: This study was approved by the Ethics Committee in Human Research of Khon Kaen University, Khon Kaen, Thailand (Reference no. HE632001).

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

Source of Funding: Self

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Labor Perceptions Concerning Exclusive Breastfeeding and Formula Milk

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Abstracts

Background: The World Health Organization (WHO) recommends exclusive breastfeeding during the first 6 months of a child's life. But the rate of exclusive breastfeeding is still low. Various factors affect the duration of exclusive breastfeeding. Work is often the reason for the failure of exclusive breastfeeding.

Objectives: The research aims to describe the perceptions of female labours regarding breastfeeding and formula milk. **Method:** This research method is qualitative research. Data was collected through observation, in-depth interviews with 6 nursing labours, 5 lactation counsellors and focus group discussions (FGD) involving 10 labours. **Results:** Perceptions of female labours regarding breast milk and milk are vary. Some labours think that breast milk is the best food for their children. But other labours think that formula milk is better than breast milk because it contains additional substances not found in breast milk. **Conclusions:** Labours' perceptions about breast milk and formula milk are still diverse. Interventions to improve mothers' understanding of the benefits and advantages of breastfeeding need to be carried out to support the success of exclusive breastfeeding

Keywords: Perception, Female Labour, Formula, Breastfeeding, exclusive breastfeeding

Background

Exclusive breastfeeding can reduce diarrhea morbidity, hospitalization due to diarrhea or respiratory infections in children and the risk of asthma, obesity, heart and respiratory problems in adulthood. Exclusive breastfeeding also reduces the risk of death from respiratory infections (RR 0.3; 95% CI 0.16-0.56) (1). Children who are breastfed in the first month of life are six times more likely to live than those who are not(1). Good breastfeeding practices have the potential to save 823,000 lives of children under five years old (toddlers) (2). Breastfeeding can save the lives of 20,000 women who die from breast cancer per year. The risk of the mother to experience post partum hemorrhage, breast and ovarian malignancies decreases with breastfeeding. Breastfeeding is also effective to regulate the distance of pregnancy and also reduce the risk of mothers

experiencing diabetes mellitus (3).

The World Health Organization (WHO) recommends exclusive breastfeeding for six months and continued until a minimum of two years old along with complementary feeding (4). The proportion of children who get exclusive breastfeeding is one indicator used to monitor and evaluate the feeding of infants and children in a country (5).

Work is often the reason for the failure of exclusive breastfeeding. ASI, according to UNICEF, is included in 24 children's rights. Breast milk is an important component to ensure children's health. The government is obliged to ensure the creation of a conducive environment for women to breastfeed their children. Working mothers must not lose their right to breastfeeding facilities (6).

Several previous studies have shown that working mothers have a risk of experiencing exclusive breastfeeding failure compared to unemployed laborers are at greater risk of failure than office workers. A person's knowledge and perception influences his behavior. This study aims to explain the perceptions of women workers regarding breast milk and formula milk that might be an obstacle to exclusive breastfeeding.

Research Methods

The study was conducted with a qualitative approach. Information was obtained by conducting interviews with 6 female labours, 5 lactation counsellors and 2 focus group discussions involving 10 labours in Special Region of Yogyakarta. Observations were made by observing several companies, lactation rooms and also some shops to find out the support of the employer and also access to formula milk. This study was approved by Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Gadjah Mada University-DR.Sardjito General Hospital (Ref: KE/FK/0634/EC/2018).

Results

The definition of exclusive breastfeeding is not yet understood by all workers. Some workers understand very well the definition of exclusive breastfeeding, but some are still incorrect. Some workers succeeded in giving exclusive ASI for 6 months, but some others gave partial or complementary ASI. Some workers think their children get exclusive breastfeeding even though the child gets ASI when the mother is at home and gets formula milk when the mother works.

"Ihaa dulu ibu ASI-nya eksklusif nggak bu?"
(*"Lhaa, did you give exclusive breastfeeding, Mom?"*)

"Oh iya...ASI eksklusif" (*"Oh yeah ... exclusive breastfeeding"*)

"Ada makanan tambahannya?" (*"Is there additional food?"*)

"iya...tambahannya ketika saya bekerja" (*"Yes ... the addition when I work"*)

Information on workers' perceptions was explored by in-depth interviews and focus group discussions. Workers who give exclusive breastfeeding think that exclusive breastfeeding is important for children.

According to them, breast milk is the best food for her child. The information was obtained from cadres, midwives or mass media such as newspapers and television. There are even workers who are willing to take unpaid leave in order to continue to provide exclusive breastfeeding for their children.

But there are also workers who think that formula milk is better than breast milk. Based on the television commercials they watched, formula milk is better because it has been added to various substances that children need, such as folic acid, AA and DHA. They have a perception that exclusive breastfeeding does not contain these substances or contain but in smaller amounts. The appearance of babies who look fat, cute and adorable on ad impressions is very interesting according to them. They want their children to grow up like models in advertisements. This situation is also supported by the fact that formula milk for babies aged 0-6 months is still sold freely and data is easily accessed in stores.

"kalau melihat iklan itu kan..anaknya lucu, gendut dan pinter..baru berapa bulan sudah merangkak lincah"

"If you see the advertisement ... children are so cute, fat and smart ... how many months have you crawled agile?"

A tough challenge is when the mother starts returning to work. Children are usually cared for by their grandmother or immediate family. Mothers often assume, milking and given to children when mothers work will be very troublesome caregivers. Mothers must express milk for backup when left to work. In addition, mothers feel "uncomfortable" or "sad" to the caregiver because preparing breast milk is considered more complicated than preparing formula milk. Mothers feel more comfortable giving breast milk directly when at home, while when left, the child will be given formula milk. Some workers start giving formula milk or supplement food before the leave period ends.

Some workers provide additional food besides breast milk before the child is 6 months old because they think that the milk production is small and does not meet the needs of their children. Children become fussy because they are not satisfied or not full even after drinking milk. Some children have even gotten extra food since the

early days of life. Complementary foods that are often given are honey water, bananas, fruit juice, dates, baby porridge, starch water and biscuits.

“Iya, diduliti madu, dikasih pisang dilembekke kan masih gitu, apalagi kalau misal kemudian ASI-nya nggak keluar, kan kasihan. Nah daripada ASI-ne suwi ...kasih madu saja. Itu yang sering terjadi atau air tajin yaa air gula. Air tajin itu yang sering ya memang itu karbohidrat, maksudnya bayinya anteng karena kenyang, tetapi kan mengalihkan ASI to bu? Jadi cukup kompleks”

“Yeah, hated with honey, given bananas softened, it's still like that, especially if for example the milk doesn't come out, it's a pity. Now instead of long ... just give honey. That often happens or starch water, sugar. Starch water is often ... yes it is carbohydrate, meaning that the baby is calm because it feels full, but does it divert milk, right? So it's quite complex “

The distance from home to workplace is also one of the reasons workers give formula milk. The long distance of the house makes the trip to and from work longer, fears of starving children make the mother decide to give formula milk or other supplementary food. From interviews and FGDs with a number of sources, self-efficacy factor is very influential on the mother's decision to give exclusive breastfeeding or not. Mother's belief that she needs and is able to provide exclusive breastfeeding is influenced by many factors both internal factors in the mother and external factors.

“ Dulu awalnya saya pikir kami akan tinggal di rumah lama, rumah ibu yang jauh..jadi saya siap-siap, anak diberi susu formula karena kalua pulang kan jauh. Ternyata ibu mau ikut ke rumah sini yang dekat dengan pabrik, lha anaknya sudah terlanjut pake dot dan minum susu formula”

“At first I thought we were going to live in a long house, a distant mother's house ... so I was getting ready, the child was given formula milk because if I go home, it's far. It turns out that the mother wants to come to a house here that is close to the factory, but her child has already continued to use pacifiers and to drink formula milk “

Economically, breastfeeding is felt as an advantage because it can save expenses. When asked to compare between children who received exclusive breastfeeding and children who did not get exclusive breastfeeding but consumed formula milk, workers thought that children with formula milk were fatter. But, according to them, children with exclusive breastfeeding have more endurance and rarely get sick

Discussion

Previous studies have shown that breast milk is the best food for babies. Breast milk contains substances needed for growth and development of children until children are 6 months old. WHO recommends exclusive breastfeeding until the child is 6 months old and then breastfeeding continues for up to 2 years with the addition of complementary foods. Achievement of breastfeeding continues to increase but not as expected.

Working mothers have some crucial time stopping giving exclusive breastfeeding, that is at the beginning of labour, when they are discharged from the hospital, at the end of the leave period and when they start working again. In the beginning of being a mother, a complaint that is often disruptive is the lack of milk production so that it is afraid of not being able to meet the needs of children. In addition, some complaints such as nipple pain, breast swelling, blisters, pain due to childbirth or other health problems ^(7,8).

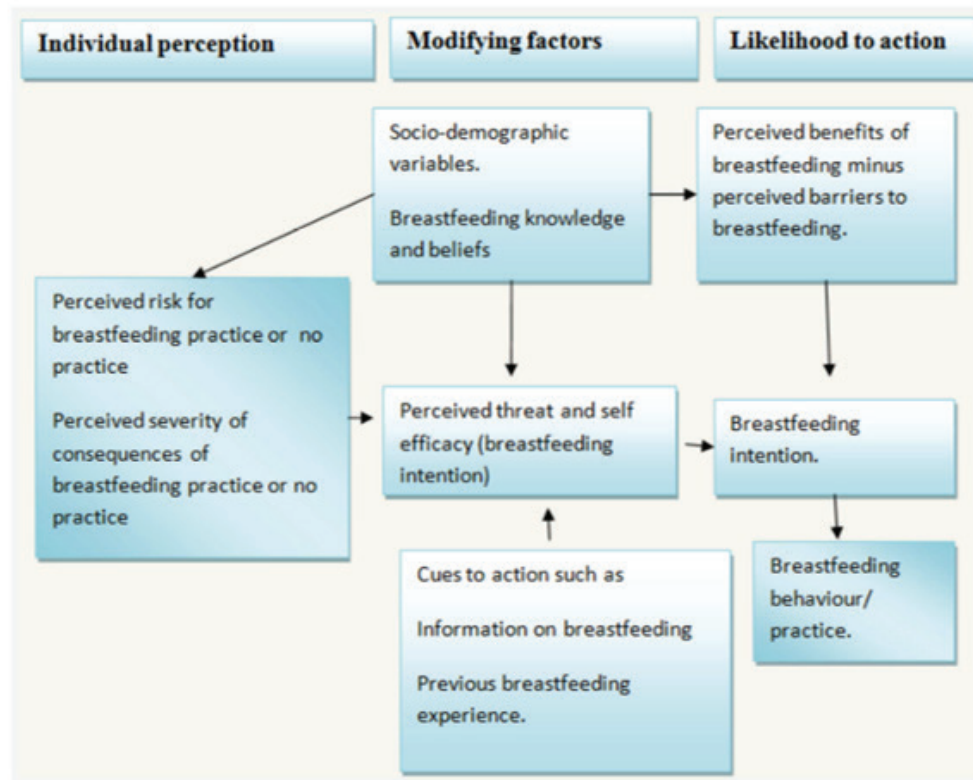


Figure 1. The Health Belief Model ⁽⁷⁾

The mother's understanding of the importance of breast milk, what are the benefits of breast milk, what are the consequences if she does not breastfeed her child, how severe the effect will be will greatly affect the mother's decision to breastfeed or give formula milk. Mothers who have the opinion that breastfeeding is beneficial to their own health and that of their offspring and if they are not breastfeeding will choose to breastfeed and provide exclusive breastfeeding. This is in accordance with the Health Belief Model theory⁽⁷⁾

Mother's knowledge and perception about breastfeeding is obtained from the information she obtained from reading, listening or observation.

Observational learning can be obtained from companion groups, counselors, previous breastfeeding experiences or from the media and other sources such as videos or talk material with others. Mother will learn from the experiences of successes or failures of others that she has heard or seen. Multiparous mothers with a history of success of exclusive breastfeeding in previous children, will have a greater chance of success than those who do not have a history of all success. Compared to those who breastfeed for more than 3 months, those who are inexperienced or breastfeeding for less than 3 months will have an earlier weaning period.⁽⁹⁾

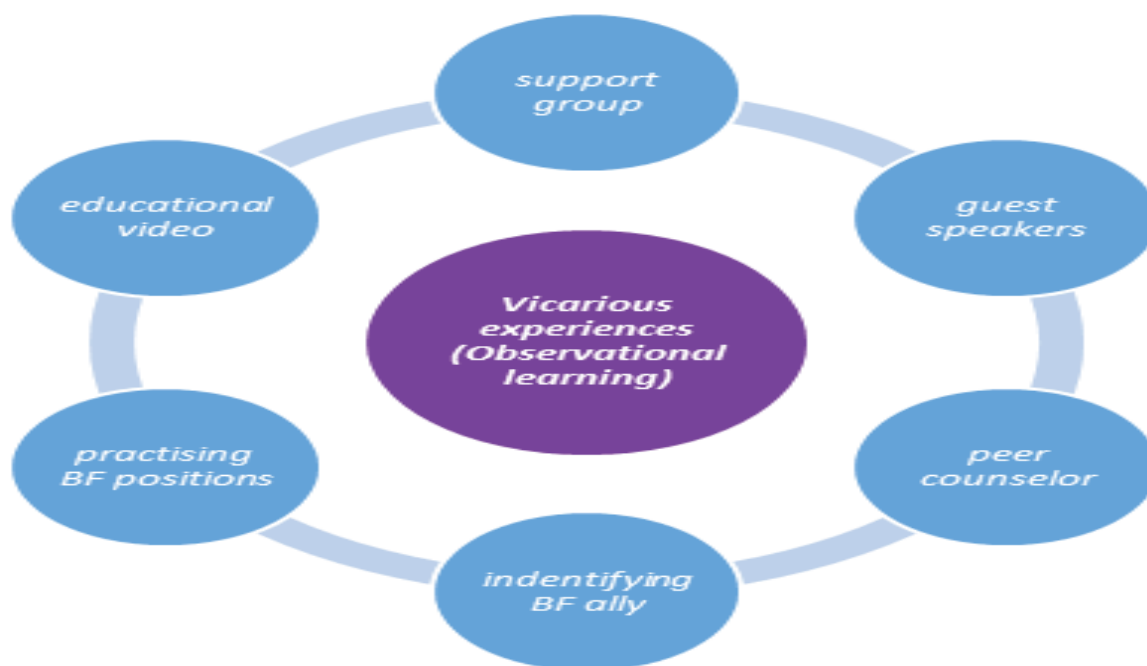


Figure 2. Observational Learning Sources

By breastfeeding her child, a mother can save a lot of expenses. Direct expenditures if the child gets formula milk to buy formula milk, extra diapers, laundry. Indirect expenditure also increased, such as the cost of going to the hospital if the child was sick, other expenses due to absence from work and others⁽¹⁰⁾.

Maternal education is an appropriate intervention. Education and counseling should start early, from the moment of marriage. Breastfeeding material is also given during antenatal care, perinatal and postpartum care. The material provided includes the understanding of exclusive breastfeeding, the benefits of exclusive breastfeeding, the disadvantages of not providing exclusive breastfeeding, how to milk, store and prepare milk. Counseling should also involve the father, because the father's very dominant role in making decisions related to children's food⁽¹¹⁾. The formation of support groups in the living and work environment also provides positive support for the success of exclusive breastfeeding for women workers⁽¹²⁾.

Conclusion

The understanding and perceptions of women workers regarding exclusive breastfeeding and formula milk differ and are not all true. This perception will affect

the behavior of breastfeeding. Educational interventions on breast milk and formula milk need to be done either by personal, family or class counseling. Support from all parties, partners, families, communities, health workers and workplaces is needed for the success of exclusive breastfeeding for workers.

Conflict of Interest: None declare

Acknowledgement: None declare

Source of Funding: It was funded by research grant doctoral dissertation, general director of higher education ministry of education and culture of the republic of Indonesia

Ethical Clearance: This study was approved by Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Gadjah Mada University-DR.Sardjito General Hospital (Ref: KE/FK/0634/EC/2018).

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Implementation of Exclusive Breastfeeding Policy in Yogyakarta District

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Abstract

Background: WHO has been recommending exclusive breastfeeding for six months since 2001. Mothers should continue breastfeeding until the child is at least two years old. The benefits of exclusive breastfeeding for mother and their children have been proven scientifically. Supporting this recommendation, the government has established several policies. The national coverage of exclusive breastfeeding is still low, including in the Municipality of Yogyakarta. **Objective:** This study aims to describe the implementation of Regulation on exclusive breastfeeding. **Method:** The research is a qualitative research with case study design. Data were obtained through in-depth interviews, focus group discussions (FGD), and supported secondary data from Yogyakarta Municipal Health Office. In-depth interviews were conducted with health officials, cadres, counselors, community health center officers determined by purposive sampling. FGD was conducted by involving breastfeeding counselors. **Results:** The government implemented PERDA no 1 2014 since February 2014, but the coverage of exclusive breastfeeding and early initiation are still low. Yogyakarta District Government conducted various programs to support the implementation of the regulation, such as counselor training, formation, and optimization of assisting groups, supervision of 10 LMKM in health facilities. There are several things should be improved, such as community involvement, supervision, and punishment of violations of local regulations. Breastfeeding success is influenced by many factors. Internal factors include mother's education level, knowledge, parity, occupation, the success of the previous breastfeeding, and self-efficacy. External factors include support of the immediate family or husband, supporting community / supporting group, formula milk promotion, and health workers supports. **Conclusion:** Effort are needed to improve the performance.

Keyword: *implementation, Yogyakarta, exclusive breastfeeding, Case Study*

Introduction

World Health Organization (WHO) has been recommending exclusive breastfeeding (EB) for six months since 2001. This policy is widely supported by professional organizations and is applied in almost all

Asia Pacific countries^[1]. The proportion of exclusively breast-fed children is an indicator that can be used to monitor and evaluate infant and children feeding in a country^[2].

EB may reduce the risk of otitis media, dermatitis, diarrhea, lower respiratory tract infections, asthma, diabetes mellitus, obesity, SIDS, leukemia in infants. EB also lowers the risk of necrotizing enterocolitis in premature infants and children malnutrition. For mothers, breastfeeding has been reported to reduce the risk of ovarian and breast cancer^[1,3]. Studies showed that optimal breastfeeding not only saves the lives of children under five, but also improves the quality of

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life^[4].

Less than 40% of children in the world are exclusively breastfed for 6 months^[5]. The Indonesian government has made several policies related to breastfeeding Law No. 36 of 2009 on Health, article 128, paragraphs 2 and 3 states that “.. the family, local government and community must support the mother in full by providing time and special facilities”. Government Regulation of the Republic of Indonesia number 33 of 2012 states that, “Every mother giving birth should give EB to the baby she is born”. In addition, the government also issued a Decree of the Minister of Health No. 450 / Menkes / SK / VI / 2004 on EB in Indonesia. Based on the Basic Health Research (Riskesdas) data in 2010, 39,8% of infants receive EB. The proportion decreases with age, therefore only 15.3% of 5-month-olds receive the EB.

Yogyakarta Municipal Government enacted Regional Regulation no 1 of 2014 on EB since 2014. The coverage of EB in the Special Region of Yogyakarta is still quite low, which is about 39%. This figure is still far from the MDGs target of at least 80% in 2015. This study aims to explain the implementation of EB regulation.

Method

This research is a qualitative descriptive research with case study design. The study examines the implementation of Bylaw no. 1 of 2014 in Yogyakarta and the factors that hinder the achievement of EB coverage target in the city. Breastfeeding coverage data was obtained from Yogyakarta City Health Office 2013-2015. Information on the implementation of Regulation No. 1 of 2014 and its obstacles was obtained by in-depth interviews with a number of persons, namely Nutrition and Family Health Section, one staff of nutrition, 3 nutrition programmer, one assistant group coach (KP) Playground staff. Serial interview conducted on 5 members of KP mother. Researchers also conducted observations on lactation facilities in various public facilities, including markets, and health centers. The group discussion was conducted by involving breastfeeding counselor and nutrition programmer in Yogyakarta.

Result

Yogyakarta City Regulation No. 1 of 2014 outlines

governance and supervision processes, early breastfeeding initiation, EB, hospitalization, breastfeeding donations, information, education and guidance, the use of infant formula and other infant products, workplaces and places public facilities, community support, rewards and administrative punishments. The regulation came into force on February 27, 2014.

The Coverage of Exclusive Breastfeeding and Early Initiation of Breastfeeding

EB according to WHO is that babies receive only breastmilk, either by direct suckling or milking, without getting any other food or drink except oral rehydration or vitamin supplements, minerals or drugs for the first 6 months of life^[6]. (Dyson, Renfrew, Mcfadden, Herbert, & Thomas, 2006). Based on this understanding, EB coverage data has not been accurate indicating the percentage or number of infants who received EB for 6 months. The 6 month EB coverage available in Yogyakarta City Health Office is 2014 data. About 30.9% of infants get EB for 6 months in 2014. The lowest percentage is in Wirobrajan PHC (18.3%).. During the implementation of PERDA no 1 of 2014, early breastfeeding increased from 59.43% to 65.30% in 2014 and 2015 respectively.

The average coverage of EB in infants aged 0-6 months has increased, ie 51.6% on 2013, to 54.9 and 60.9% in 2014 and 2015 respectively. The Government continues to socialize the EB program. Promotion efforts are done through various media either printed, electronic or directly through counseling by health workers. The process of socialization and coaching by the Government is carried out primarily through Nutrition and Family Health Section of Health Office.

Yogyakarta Health Office conducts socialization, guidance and supervision of the implementation of PERDA no 1 year 2014 especially to PHC, private practice midwife, mothers and child clinic or hospital. As for large hospitals such as hospitals, coaching and supervision performed by the Provincial Health Office. However, the regulation has not been implemented, especially in relation to punishment for individuals or institutions that prevent women from breastfeeding their children. Supervision on the distribution and trade of formula milk is also still not running well. Formula milk, including infant formula for less than 6 months is

still very accessible. The promotion of formula milk that is considered very massive becomes a serious challenge for EB promotion efforts.

The community voluntarily play an active role in the activities of the Group of Counselors (KP) Mother. Members of KP are bride-to-be, pregnant women, nursing mothers and other mothers concerned about maternal and children health, but limited membership of the bride and groom. In each mother KP, there is a mother who acts as KP chairman, motivator, and KP builder. Motivators are members of the KP who have a supportive scientific background, such as nurse. The coach of KP consists of elements of community leaders or PKK in urban village level. The coaching process in collaboration with health workers from the community health center (Puskesmas). The implementation of MOM KP is more directed to team work (Pokja) IV, and

is an effort of community empowerment.

(“... peer groups there ... and they’re sharing ... reinforcing each other. And that they are the people who are around them .. hope that there is anything can be faster .. and if not observe .. The breastfeeding mothers do not yet understand if they have trouble breastfeeding (NS-I).)

The coaching of health workers, motivators and counselors is conducted by the Government. Health Office perform monthly routine coordination with PHC and also coordination with motivator. Maternal related materials, children growth, maternal and children health are provided in each meetings. The theme of the material is tailored to fulfil the needs of participants. The meeting also discussed the problems that occurred in the field delivered by motivators and their coaches

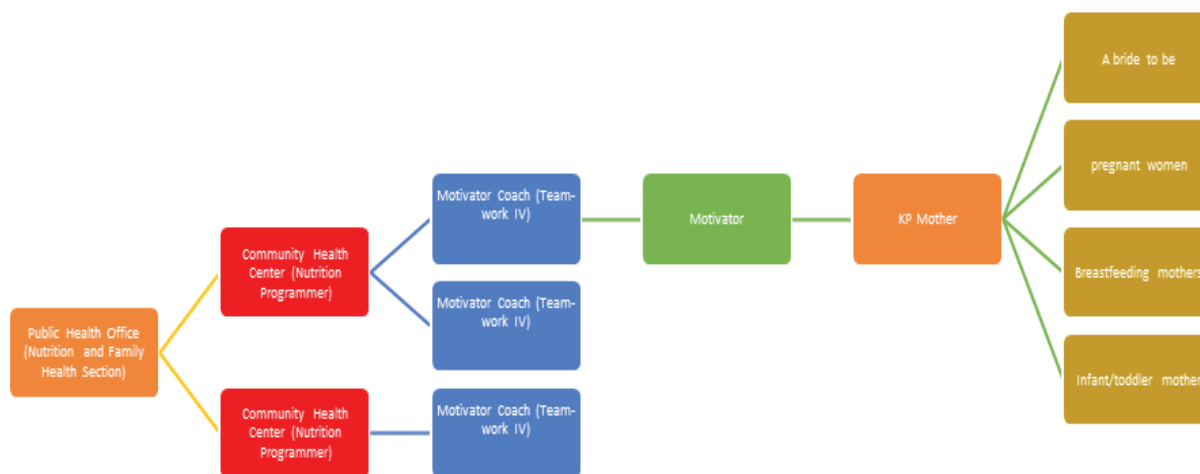


Figure 1. Level of Supervision and Development of Breastfeeding

Human Resources (HR)

Due to the limited of human resources, a breastfeeding counselor usually doubles as another counselor, such as nutritional or family planning counselor. Likewise for cadres who come from elements of society and are voluntary. Regeneration process has been running poorly. One cadre usually also doubles as a cadre in several other fields. This is caused by the difficulty of finding citizens who have the motivation, commitment, time and energy to participate as a health cadre. Counselors have been required to proactively find the problems. Many mothers do not realize and understand

that she has problems. Breastfeeding problems were found after the officer experienced a health problem, such as malnutrition or diarrhea. Mothers with good self awareness came for consultation on breastfeeding are very rare.

Infrastructure

The government provides several facilities to support the implementation of this regulation. The lactation room was built in Yogyakarta city government office and some public facilities such as mall, railway station, market, and all PHC in Yogyakarta. However, there are many problems in the infrastructures area

include: the quality of the lactation room, some PHC perform another service on the breastfeeding room when it is vacant.

The opening hours of lactation facility services in public places that are less flexible, such as those in Beringharjo market open the service starting at mid-day when breastfeeding should be carried out all the children. Socialization about lactation room facilities is also lacking. There is a lactation facility financed by formula milk producers, but this certainly becomes a dilemma itself in the implementation of this regulation. Family support, especially husband and grandmother also greatly affect mother's behavior.

Working are often the reason to stop breastfeeding. Lack of mother's knowledge and skills are the reason the mother stops breastfeeding her child. This is often experienced by women with low socioeconomic so difficult to get equipment to milk and store milk.

Discussion

Most maternal failures to exclusively breastfeed occur during vulnerable periods, in the first post-natal days and at the end of the leave period^[7]. Maternal knowledge and perception about breastfeeding is a very important factor. At the beginning of the breastfeeding period, there is often a mother's perception that her milk production is inadequate for her child's needs therefore the baby is fussy, or another the perception that formula is better than breast milk often encourages the mother to provide formula milk. Knowledge of the benefits of breastfeeding, the negative effects of formula feeding, the correct and effective breastfeeding method will strengthen the beliefs of mothers to breastfeed their children^[8].

Previous research has shown that the level of maternal education is significantly associated with the duration of breastfeeding. Provision of information or counseling since before pregnancy, during pregnancy and postpartum become important interventions to do^[9].

Previous studies have shown that employment status has no effect on breastfeeding. But the opposite is found in other studies. The return of mothers to work after leave is the cause of the reduced frequency of breastfeeding. Several studies conducted in the UK,

Malaysia and Singapore, showed the result that return to work causes 30-58% of mothers to stop breastfeeding^[10]. Women workers have limited time and distance^[11]. The short duration of leave is presumed to be one of the determinants of the decline in EB^[12].

Only 25.4% of working women in Malaysia give EB. On average they only give milk for 26 weeks. The unavailability of support facilities is a strong reason why women stop breastfeeding. Mothers with normal delivery will have 9.02 times the likelihood of EB (IK95% 2.8-28.5). Mothers who work as civil servants have fewer risks to stop breastfeeding after leave time.^[13]

Mothers who do not work outside the home are 3.5 times more likely to succeed in EB than working mothers. Working mothers tend to wean their children towards the end of the leave. Job exhaustion, short duration of leave, the need for immediate return to work and limited facilities or support in the workplace is the reason for failure in working women. Research on the association of EB with parity and level of education shows inconsistent results.^[14, 15]

The success of EB is influenced by many factors, both internal and external factors. Internal factors are factors that exist in the mother, including maternal health, knowledge, mother's perception of EB, and self efficacy. External factors can include family support, community around mother, biosocial, cultural, workplace support, government, health personnel and promotion of formula milk.^[14,16,17,18] Implementation of EB in developing countries is heavily influenced by demographic, socioeconomic, and other health-related factors.^[15]

Conclusion

The government has implemented PERDA no 1 2014 since February 2014, but coverage of EB and early breastfeeding is still low so there is still a need to increase the achievement. The Yogyakarta Government has implemented various programs to support the implementation of PERDA in breastfeeding, such as counselor training, formation and assistance of assisting groups, supervision of 10 LMKM in health facilities. The success of breastfeeding is influenced by many factors, namely mother's internal factors and external factors.

Conflict of Interest: Authors report no conflict of

interest.

Source of Funding: It was funded by research grant doctoral dissertation, directorat general of higher education ministry of education and culture of the republic of Indonesia

Ethical Clearance: This study was approved by Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Gadjah Mada University-DR.Sardjito General Hospital (Ref: KE/FK/0634/EC/2018).

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Myofascial Trigger Point Release Therapy in the Management of Plantar Heel Pain

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Abstract

Study design: Interventional Trial

Objectives: To investigate the effect of myofascial trigger point release (MFR) therapy in management of unilateral plantar heel pain (PHP).

Background: PHP is characterized by pain in the heel region and is restricted to the sole of foot with tenderness of the heel region. Plantar heel pain is more common foot condition managed by health care professionals and accounts for 8 % of all injuries. It's not known whether inclusion of MFR can further improve the outcomes in patients with PHP.

Methods: 42 patients, 14 men, 28 females (mean \pm SD age, 42.76 \pm 11.73) with diagnosis of unilateral PHP where divided into two groups. Patients in control (CRT) group received ultrasound therapy and stretching therapy. In addition, experimental (ERT) group received MFR. The result was measured using following outcomes: Dorsiflexion range of motion, Pain Pressure Threshold (PPT), self reported pain Outcome measure (Numerical Pain Rating Scale-NPRS), Foot and Ankle Ability Measure (FAAM). Outcome of interest were measured at baseline and after 10 day follow-up.

Results: Significant difference was present between groups in all outcomes. In additionally within group and between group effect size were calculated using Cohen d co-efficient. The effect sizes for the variables were found to be moderate to large demonstrating the positive effects of MFR.

Conclusion: This study proves that addition of MFR results in superior short-term outcomes compared to stretching with ultrasound therapy alone in treatment of unilateral PHP.

Key words: Ankle plantar flexors, Peroneals, myofascial Trigger points release therapy, Plantar heel Pain

Introduction

Plantar heel pain (PHP) is characterized by pain in the heel region due to inflammation of the plantar fascia. PHP is restricted to the sole of foot with soreness or tenderness of the heel region and is more prevalent in individuals with the age of 25-65 years.¹

PHP is a common foot condition and accounts for 8% of the musculoskeletal injuries.² PHP is characterized by pain in the heel region and may be caused due to presence of myofascial triggers in the gastrosoleus muscle and peroneal muscles.³ Myofascial trigger

release (MFR) leads to reduction of pain and increase in the ankle range of motion. MFR therapy is the method of gentle application of pressure on the tender hyper irritable fascia points.¹

PHP commonly occurs during middle age and females are more prone. Conservative management is successful for approximately 90% of cases with PHP.⁴ it's believed that patients with PHP showed reduced flexibility of calf muscles and reduced range of motion of ankle joint and triggers in gastrocnemius. This reduced flexibility of gastrosoleus can alter the biomechanics of

foot causing an overloading in plantar fascia resulting in PHP.⁵

It is reported that there is a direct reference for PHP with the presence of myofascial trigger points (MTrPs) in calf muscles. These MTrPs present in the leg muscles can be due to deconditioned muscles or tightness. Presence of MTrPs in the abductor hallucis and plantar musculatures can also lead to PHP.⁶ It is suggested that manual therapy of active and latent trigger points (TrPs) in the gastrocnemius and soleus has been effective in the management of PHP.^{6,7}

In addition to the presence of MTrPs in calf muscles, the involvement of peroneal muscle in PHP even though accepted, very few studies establish the importance of peroneal MFR therapy along with gastrocnemius and soleus release. So, this study was taken up to establish the improvements in parameters like pain, ROM, muscle flexibility, pain pressure threshold and Physical function in subjects with PHP.

So, it is hypothesized that MFR therapy in gastrocnemius, soleus and peroneal muscles along with routine treatment would produce better results in terms of reduction in pain and improvement in function. Due to the scarce of literature related to the effectiveness of management of PHP and lack of evidences present, we intended to explore the presence of MTrPs and the effectiveness of MFR therapy in subjects with PHP.

Methods

Participants

Patients reporting with PHP to Rehabilitation Centre, Sri Ramachandra Hospital in Chennai with primary complaint of unilateral PHP were screened for inclusion in the study.

Inclusion criteria required subjects to be within the age group of 25-55 years with the following presentation: 1. Localised pain in the heel region during weight bearing following a period of non- weight bearing, 2. Heel pain with first steps in the Morning upon weight bearing 3. Pain easing with walking 4. Positive windlass test, 5. Tenderness and pain with proximal plantar fascia insertion, 6. Negative tarsal tunnel test.⁸ Subjective examination included the onset of pain, duration of the symptoms, treatment. Patients were excluded from

the study if they had any of the following 1. Ankle and foot fracture, 2. Ligamentous injury, 3. Peripheral neuropathies, 4. Neurological Tarsal tunnel syndrome, 5. Vascular problem, 6. Red flags to soft tissue manipulation 7. History of ankle and foot surgery 8. Fibromyalgia syndrome, 10. Soft tissue (heel contusion, retro calcaneal bursitis, fat pad atrophy).⁸

This study was approved by the Institutional Ethical Committee of Sri Ramachandra hospital and all the patients signed a written informed consent prior to the treatment (CSP/16/JUN/49/191). Based on the previous study results, a power analysis was done and the sample size for the present study was calculated and found to be 38. Attrition rate of 10% was considered and the sample size was estimated to be 42. Fifty consecutive subjects were screened for eligibility criteria, 42 subjects satisfying the eligibility criteria agreed to participate in this study. The subjects were randomized into control (n=21) and interventional group (n=21) using random allocated created by online software (RANDOM.ORG). The reasons for ineligibility were Ankle fracture (n=2), Peripheral Neuropathy (n=5), Vascular problem (n=1).

Outcome Measures

Baseline and final evaluation were performed, Baseline evaluation included demographic data, pain (NPRS), ankle range of motion, pain pressure threshold (PPT) of trigger in gastrocnemius, soleus, peroneal muscles and the functional aspects of the subjects was assessed by using the foot and ankle ability measure (FAAM) questionnaire.

Study Protocol

All the patients underwent the physiotherapy treatment for 5 days a week for 2 weeks. The subjects were assessed for pain type, character, duration, severity, irritability and nature. The patients were then asked to rate their pain in a ten-point scale of NPRS. All the details were secured and the same assessment procedure was followed at the end of the session for the analysis.⁹

The triggers were assessed for pain pressure threshold by using Pressure Algometer. This was done in control and intervention groups. By using an index knobler the triggers were released followed by which cryotherapy was given to the trigger released regions in

Interventional Group for 10 minutes duration.

Stretching exercise program

All plantar heel pain patients in both the groups were advised to perform calf, peroneal and stretching and plantar fascia stretching – specific exercises which have moderate evidence in management of PHP⁸ Dosage of Passive stretching exercise to Gastrosoleus, peroneal and plantar fascia was 1 time, 5days per week for 2 week, using static stretching of 30 seconds followed by 20 seconds rest with 5 repetition. For self stretching at home, the dosage was 2 times per day, stretching of 30 seconds and rest for a total of 3 minutes for each stretch with 5 repetitions. Participants were advised to start work gently and gradually to perform more aggressively but within limit.^{6,7}

Ultrasound therapy

Patients in both the groups with heel pain were treated by Ultrasound Therapy (3MHZ frequency) for 10 minutes duration followed by stretching exercise program.

Myofascial trigger point release therapy

Patients in the intervention group were examined for presence of active MTrPs in Gastrocnemius, soleus, peroneal muscles by a clinician with experience in management of TrPs. Trigger points were diagnosed according to the presence of palpable hypersensitive taut band, presence of twitch response on palpation of the taut band and reproduction of referred pain on compression of TrPs.¹ The presence of the following features have exhibited a good inter rater reliability ($k=0.84-0.88$).¹⁰ Systemic review showed moderate to strong evidence that MFR therapy immediately relieves pain of muscle TrPs. In this study pressure was applied over TrPs until muscle resistance was felt by the therapist. The pressure was maintained until the feel of release of taut band felt by the therapist.^{10,11} MFR therapy was performed based on the presence of TrPs on the affected leg.

Statistical Analysis

Statistical Analysis was conducted using SPSS Version 16.0 software. To describe the data, descriptive analysis and percentage analysis was used for categorical variables and mean & standard deviation were used

for continuous variables. To find out the significant difference between the samples paired t - test was used for the normal data and for the skewed data Wilcoxon signed rank test was used & for the independent groups unpaired sample t- test was used. To find out the significant difference in categorical data Mann Whitney U test was used. In addition to the within-group and between-group analysis, the effect sizes were calculated using Cohen *d* coefficient. Effect sizes of 0.2 were considered small, 0.5 moderate, or 0.8 were considered large. *P* values lower than .05 was considered as statistically significant for all analyses.

Results

At baseline, No significant differences were found for age (42.85 ± 11.2 & 42.66 ± 12.25 , $P > 0.05$), Pain duration (59.52 ± 68.23 & 58.14 ± 41.01 , $P > 0.05$), BMI (28 ± 2.95 & 27.47 ± 2.44 , $P > 0.05$). Additionally, pain ($P > 0.05$), ROM ($P > 0.05$), PPT [Gastrocnemius ($P > 0.05$), Soleus ($P > 0.05$), Peroneals ($P > 0.05$)], FAAM ($P > 0.05$) were not significantly different between groups.

Changes in PPT: Between group analysis revealed significance for PPT on Gastrocnemius ($P < 0.001$), Soleus ($P=0.07$), Peroneal ($P=0.01$). Table 2 summarizes the within Group and Between Group difference and associated 95% confidence interval for PPT level in both groups. The between group effect size ranges for pain was large (2.9), for PPT it ranged from small to moderate (gastrocnemius =0.7, soleus =0.1 and peroneal muscle=0.5).

Changes in pain and FAAM: Between group analysis was statistically significant for pain $P<0.001$. The FAAM which is self-report instrument assess physical function in subjects with foot and ankle impairments showed significance changes ($P < 0.001$). Analysis using unpaired t-test revealed a significant change in the main outcomes of the study: pain ($P < 0.001$) and FAAM ($P=0.001$).

Patients receiving a combination of self stretching, ultrasound and trigger point release experienced greater improvement in pain, PPT and FAAM. It was noted that there was a large to moderate between-group effect size for primary outcomes (pain and FAAM).

Table 1							
Base line, Final Treatment Session, Change Score and Effect size for Numerical Pain Assessment Scale, Pressure Pain Thresholds, FAAM							
Location/ Group	Baseline	End of Treatment	Within Group Change	Within -group effects size	Between Group Difference	Sig	Between group Effect size
NPRS							
Control	5.2(0.4)	4(0.5)	1.24(1.04,1.44)	2.7	1.9(-2.28,-1.53)	P<0.001	2.9
Intervention	5.5(0.5)	2.4(0.6)	3.14(2.81,3.47)	5.6			
PPT							
Gastrocnemius							
Control	3.1(0.8)	3.4(0.9)	-0.36(-0.58,-0.14)	0.4	0.64(0.3,0.98)	P<0.001	0.7
Intervention	3(0.9)	4(0.9)	-1(-1.27,-0.73)	1.1			
Soleus							
Control	3.5(0.6)	3.8(0.7)	-0.28(-0.5,-0.06)	0.5	0.4(0.12,0.68)	P=0.007	0.1
Intervention	3.2(0.9)	3.9(0.7)	-0.68(-0.87,-0.49)	0.9			
Peroneal							
Control	4.31(0.83)	4.5(0.7)	-0.16(-0.41,0.09)	0.2	0.62(0.26,0.98)	P=0.001	0.5
Intervention	4.08(1.11)	4.9(0.9)	-0.78(-1.06,-0.5)	0.8			

Cont... . Table 1

FAAM							
Control	48.9(12.9)	55.5(10.8)	-6.63(-8.65,-4.61)	0.6	20.56(16.14,24.99)	P<0.001	1.5
Intervention	41.6(8.6)	68.8(6.5)	-27.19(-31.23,-23.16)	3.6			

Discussion

The current study shows that inclusion of MFR therapy along with ultrasound and stretching protocol results in greater decrements in pain and improvement of physical function in comparison with control group which received ultrasound and stretching program alone.

In accordance with earlier studies done by Alvarez, et al, it was observed that females were more affected with plantar heel pain than their male counterparts. It was found that in this study too females were more involved than male with plantar heel pain.¹²

The result of the study suggests that inclusion of MFR therapy will result in superior, short term outcome in individual with PHP. The magnitude of benefit when compared in term of effect size was moderate to large in primary outcome like pain, PPT (gastrocnemius, soleus and peroneal), FAAM. The MCID for NPRS and FAAM is 3.1 and 27.2 points respectively.^{9,13,14} The results of present study surpassed MCID values of NPRS and FAAM.

The prevalence of MTrP in gastrocnemius, soleus, peroneal in subjects with PHP was clarified and treated in the study. The taut band with trigger points in these muscle decreases flexibility of muscles resulting in PHP. Therapy directed towards increasing flexibility of these muscle by passive stretching and MFR by compressing the sacromere by direct pressure may equalize the length of sacromere eventually reducing PHP.^{3,7,8} The result of our study proves that the effect size was large proving clinical effect of intervention over pain sensitivity. The MCID value of trigger point release has not been yet studied and our study result is consistent with previous

studies that support MFR therapy decrease pain pressure threshold sensitivity. No adverse events were noted during treatment session. The subjects were not followed after treatment sessions, hence long-term effect of the treatment could not be evaluated.

MFR showed improvements in pain pressure threshold, decrements in pain and improved physical function, therefore it becomes evidence that the deactivation and resolution of triggers in calf and peroneal muscles results in superior outcomes.¹⁵

The results of the study clearly indicate that MFR in the presence of triggers is beneficial in the management of PHP. It is recommended that during musculoskeletal examination in the subjects with PHP we should include trigger tracing in calf muscles and peroneal muscles. Myofascial trigger point as a choice of treatment in subjects with PHP is strongly indicated.

Conclusion

Subjects with PHP, MFR therapy along with conventional treatment was found to be clinically more effective in the improvement of pain, range of motion, PPT (gastrocnemius, soleus, peroneal) and improvement in functional status

Key Points:

Findings: The addition of MFR therapy to standard conventional therapy which used ultrasound and stretching protocol gives superior outcomes in subject with PHP at short term.

Implication: Identification of MTrPs in subjects with PHP must be considered by physical therapist

during diagnosis and treatment.

Caution: Long term effect

Conflict of Interest – No conflict of interest between authors

Source of Funding – Chancellor's Summer Research Grant UG Students, SRIHER

Ethical Clearance - Obtained

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Association between Perceived Stress and Resilience among University Students

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Abstract

Background: Stress is not unfamiliar in our daily livings especially in student population. Undergraduate students tend to expose to stressors from various sources such as academic performances, family issues, financial problems and etc. Stress can be positive, keeping us alert and ready to avoid danger. In this context, resilience plays a vital role to allow students to overcome, adapt and cope well with the stresses. The aim of the study was to assess the level of perceived stress and resilience among university students and to determine the association and relationship between perceived stress and resilience.

Methods: Perceived Stress Scale and Resilience Scale were distributed to the undergraduate students in a private university. An online questionnaire was also shared through social media for students to answer.

Results: Overall, the mean age among the 355 participants were 20.83. Gender differences were found in stress and resilience level. Female were found to have higher PSS score ($p=0.006$) and lower RS score ($p<0.001$) compared to male. Pearson's Correlation showed that there was a moderate negative association between perceived stress level and resilience among undergraduate students ($p<0.001$). Null hypothesis was rejected.

Conclusions: In conclusion, undergraduate students had moderate perceived stress and low resilience level. There were association between perceived stress level and resilience among undergraduates students. Thus, specific intervention such as stress management and resilience enhancement program can be conducted to improve the scenario.

Key Words: Association, Perceived stress level, Resilience level, undergraduate students.

Introduction

Stress is not unfamiliar in our daily livings. Stress is described as a feeling of being overload wound uptight, tense and worried or an unspecified reaction of the body towards sudden alteration or modifications of the environment. Stress contributes to various respond in the human body^[1]. Stress can be positive, keeping us alert and ready to avoid danger. Stress becomes negative when a person faces continuous challenges without relief or relaxation between challenges. As a result, the person becomes overworked and stress-related tension builds. In the others words, if an individual experiences a short-term stress, the stress can act as a motivator to the individual to face and overcome the difficulties or

challenges. The stresses might affect your physical and mental health^[2].

According to American Psychological Association, stress consists of various forms and it can be classified into 3 main types including acute stress, episodic stress, and chronic stress. Acute stress is the type of stress which may cause fight or flight responses particularly when an individual experienced danger and it usually occurs in just a short period of time^[3]. The episodic stress, is a stress that caused by some combination of stressful events that leads endless overthinking and worrying of the individual for the particular incidents. Chronic stress can develop from bad experiences in the childhood, poor relationship with the loved one and so forth^[4].

American Medical Students Associations (AMSA), it claimed that different study year of students tends to face different types of stresses. First-year students tend to feel stress due to increased workload and demand for their academics. Second-year student would feel anxious, pressure and nervous while studying many diseases at ones for the very first time. They also develop stress due to the upcoming practical and theory examinations. Third-year students tend to feel stress when entering clinical rotations and postings in different hospitals. At this time, they need to deal with real life situations and the death of their patients for the first time. Fourth-year student faces stress especially from the job applications, various interviews, and transition from medical school internship. They need to consider the development of their profession and alter their mindsets of being a student after graduation [5, 6, 7].

Resilience is generally considered as a “positive adaptation” after a stressful or adverse situation. In other words, resilience is the ability and capability to rebound back from a negative experience. Resilience can be built through many ways and acts as a good stress management for students [8]. Resilience can be explained in terms of optimism and pessimism. Personal control means resilient people do not find excuses for themselves when negative incidents happen [9]. In conclusion, students should develop resilience when they facing with stress in order to ensure they are coping well with the current situation. The main aim is to study the level of perceived stress and resilience among students in a private university and also to study the relationship between perceived stress and resilience among students in a private university.

Methodology

The study was a cross-sectional study to examine the relationship between perceived stress and resilience among University undergraduate’s students. The data collection duration consists of 4 weeks. The study was conducted in a private university at Malaysia. The sample size was calculated by using the formula suggested by Cochran in 1977: The estimated sample size in this study is 320 participants. The selected participant must be willing to participate in the study. The expected prevalence was adopted from a recent study focusing

on Malaysian students⁷. The target population were all undergraduate students from a private university and was recruited through Google forms and face to face approach. The sampling method used to collect the responses from participants was convenience sampling, a non-probability sampling method. The Inclusion criteria for this study were: Male and female participants Aged between 18 to 25 years old, Undergraduate’s students, all ethnic groups and the exclusion criteria for the study Individual who do not complete the questionnaire and individual who do not understand English.

The instrument utilized were Section A: demographic data including age, gender, faculty, course and year of study. Section B: Perceived Stress Scale (PSS) questionnaire which is used to measure the perception and level of perceived stress. The PSS consists of 10 items instrument that includes questions about one’s feelings and thoughts in the last one month. The higher score represented a higher level of perceived stress. Section C: Wagnild and Young Resilience questionnaire which contains 25 questions with 7 point rating scale. The higher the score the individual gets, the greater the resilience the individual had.

Procedure

The ethical approval was obtained. All students from all the faculties from a private university were approached using the questionnaire for them to answer. The researcher explained the subject and ensures the subjects have no doubts about the research. The subjects received an informed consent form, a self-administered paper questionnaire that includes Demographic data, Perceived Stress Scale (PSS) and Resilience questionnaire. The questionnaire will take an approximate of 15 minutes to complete. The obtained data will be used for analysis.

Results

A total of 335 participants out of 348 participants have fulfilled the inclusion criteria of the study. The study only included data from the 335 participants for the data analysis. The responses rate was 100%.

Mean differences of Perceived Stress Scale and Year of Study

Year of Study	Mean PSS score (SD)	df	F	p-value
1	19.90(5.871)	4	1.342	0.254
2	19.30(5.431)			
3	20.63 (5.467)			
4	18.95 (5.362)			
5	16.00 (5.657)			

Note: One-way ANOVA test was performed; df = degree of freedom; level of significant at $p < 0.05$; SD = Standard Deviation

The mean differences between PSS score among 335 participants based on year of study. One-way ANOVA was performed to determine and compare the means PSS score of all participants between different years of study including Year 1, Year 2, Year 3, Year 4 and Year 5. In the test, there was mean difference between different years of study in which the mean and standard deviation

was 19.90(5.871) for Year 1, 19.30(5.431) for Year 2, 20.63 (5.467) for Year 3, 18.95 (5.362) for Year 4 and 16.00 (5.657) for Year 5, however, mean difference was not enough to make a significant difference as *p-value* 0.254 which was greater than the preset *p-value*. The results showed there was no statistically significant difference between Year of Study where $F = 0.254$. whole.

Mean differences of Resilience Scale Score and Year of Study

Year of Study	Mean RS score (SD)	df	F	p-value
1	116.36 (16.687)	3	0.666	0.616
2	119.78 (17.474)			
3	117.64 (16.818)			
4	115.86 (12.076)			
5	125.50 (10.607)			

Note: One-way ANOVA test was performed; df = degree of freedom; level of significant at $p < 0.05$; SD = Standard Deviation

The mean differences between RS score among 335 participants based on year of study. One-way ANOVA test was performed to determine and to compare the means RS score of all participants between different ethnicity groups including Year 1, Year 2, Year 3, Year 4 and Year 5. Year 5 had the highest mean and standard deviation of RS score which was 125.50

(10.607), followed by Year 2 119.78 (17.474), Year 3 117.64 (16.818), Year 1 116.36 (16.687) and Year 4 115.86 (12.076). The results showed there were mean differences between groups, the *p-value* of the test is 0.616 which was greater that pre-set *p-value* of $p = 0.05$. The results showed there were no statistically significant differences between Year of study determined by one-

way ANOVA where $F = 0.616$.

Correlation between PSS score and RS score

	Mean (SD)	n	r ²	p-value
PSS score	19.91 (5.533)	335	-0.44*	<0.001
RS score	118.09 (16.730)			

Note: *Pearson coefficient correlation test was performed; SD = Standard Deviation r^2 = correlation coefficient; level of significant at $p < 0.05$; n = number of participants

A Pearson coefficient correlation test was done to examine the strength of relationship between the PSS Score and RS score among participants. The PSS score collected in the study was normally distributed, as the *p-value* of PSS score was 0.120, which was greater than $p = 0.05$ based on the normality test. The total sample size was 335 without any missing value. The test showed a negative correlation as $r^2 = -0.44$, indicated that there was a moderate negative relationship between the PSS score and RS score, in other words, as PSS score increases, the RS score decreases. The *p-value* of the test was lesser than 0.001 which was lesser than $p = 0.05$, showing that the data was statistically significant between PSS score and RS score. Thus, there were moderate negative correlation between PSS score and RS score among all the participants.

Discussion

The study was to determine the level perceived stress and resilience among private university students. In the study, there were a total of 355 undergraduate students recruited was 355. In general, 74.6% of the undergraduate students had the prevalence of stress of 19.91 (± 5.533) out of 40 measured by PSS. The undergraduate students had moderate stress level in overall. The results were consistent with the previous studies^[5]. When comparing the stress level with gender, the results showed that about 60.9% female participants tend to have more perceived stress than the male participants. Female tend to be identified by feminine role and male tend to be identified by masculine role. Thus, female will tend to express their feelings and emotions than male^[10]. The results are still debateable and different opinions were stated in previous studies^[11]. According to the American Psychological Association, claimed that female have

more stress compared to male because female tend to voice up about their feelings and problems compared to male who would rather keep everything to themselves. Another was due to the hormonal differences between male and female claimed according to American Institute of Stress. Thus, the distribution of gender can influence the results of the study and therefore, future research should ensure equal number of genders in the study. In this study, stress level showed to have different results when comparing with ethnicity. The results showed that Malay and Indian ethnicity was prone to have higher PSS score compared to Chinese and Other ethnicity. The present study was not the first study to compare the stress level across ethnicity in Malaysia, yet, there are still limited research had worked on this aspect. The results showed that there were statistically significant differences between ethnic groups as *p-value* was 0.023. The results were in lines with a study showed that Malay ethnicity tends to have greater anxiety and stress compared to other ethnic groups^[12].

The resilience levels mean RS score among the undergraduate students was 118.09(± 16.730) which indicate a low resilience level. This result was not in line with other studies which indicating undergraduate students had moderate stress level and but a high level of resilience scale^[13]. In the present study, Male tends to have a higher resilience level than female. The mean RS score and standard deviation of male to female were 122.24(± 18.474) and 115.42 (± 14.957) respectively. This result showed that gender and resilience were statistically significant ($p < 0.001$). The results can be supported by a study which claimed that gender difference on resilience level is still debateable. In their studies, the results showing that male tend to have higher resilience level and their results in line with the

present studies. They suggested that female had a lower resilience level were they are less likely to expose into the stressful condition and also female used a different coping strategy compared with male^[14, 15].

The present study was to determine the relationship between perceived stress and resilience among private university in Malaysia. There was a significant negative relationship between perceived stress and resilience level among university students by using Pearson Correlation Test ($p < 0.001$). The stress level increases among students, the resilience level tends to decrease. This result was sufficient to reject the null hypothesis which was there is no significant relationship between perceived stress and resilience among private university students in Malaysia. The result of this study was consistent with other studies^[13, 16]. The importance of the present study was to determine the stress level and resilience level of university students and to detect whether the student able to cope and manage the stress effectively and to see the stress level was too overwhelming for the students. From the findings, the resilience level of the students was considered low. Thus, interventions like stress management or resilience enhancement program to be implemented.

Conclusion

The study concludes that, undergraduate students had moderate perceived stress level and a relative lower resilience level. In this study, stress had found to have mean differences between gender and ethnicity whereas resilience showed differences only between genders. There was no difference found between faculty and year of study with perceived stress and resilience of undergraduate students. In term of correlation and association, there was a moderate negative correlation between perceived stress and resilience among undergraduate students. As mentioned, resilience is an important factor to ensure and determine the ability and capability of the students to adapt and make a quick rebound from the stressful situation and adversity.

Recommendations

In future, the study should be conducted with a larger sample size which comprised of an equal number of participants with different characteristics such as gender, faculty, ethnicity and year of study can be

implemented. Significant differences between the stress level among students in urban and rural area^[17].

The study should be carried out from time to time in order to examine whether any changes towards the stress and resilience level of the students to ensure their mental and psychological health. Moreover, future study should include the sources of stress, academic performances and coping strategy to enable detection of new sources of stress and behavior of the students towards the stress.

Ethical Clearance: The study was subjected to the ethical approval from Universiti Tunku Abdul Rahman Scientific and Ethical Review Committee (SERC).

Source of Funding: Self-Funding

Conflict of Interest : Nil

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The Effect Of Assertiveness Training On The Management Of Student Emotion In Preventing Violent Behavior

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Abstract

Objective: This study aimed to determine the differences in student's ability to manage emotions, before and after intervention with Assertiveness Training to prevent violent behavior.

Method: This study was conducted in Vocational High School 1 and 2 Gunung Sari in Makassar, Indonesia. The design of this study used the Randomized Control Group Pre Post Test Design. This research followed by 60 subjects selected by simple random sampling. The research instrument used questioners adopted from Agency and Tridhonanto (2009)¹ using the Likert Scale. The data was analyzed using Independent T-Test and Mann Whitney.

Result: The result showed that the score of students' ability to manage emotions from 4 (four) sessions were different. The score of intervention group was higher than the control group after 4 (four) training sessions. There was no significantly differences among groups.

Conclusion: Students have sufficient ability to manage emotions before assertiveness training. There is an increase in students' ability in managing emotions after assertiveness training.

Keywords: Assertive training, student emotions, violent behavior

Introduction

Violent behavior is an individual's behavior aimed to hurt or injured other individuals or destruct environment. The high level of violent behavior occurred due to one's inability to control emotions or anger.²

In the school where the social environment is growing, the ability to manage emotions can be seen in the daily lives of students when interacting with their environment (parents, teachers, friends). This shows that student's emotions at the school level are the basis for the formation of student's personalities and adaptation to their social environment, where lately students able to manage their emotions and solve their own problems.

The form of emotional reactions possessed by school students were not the same as adults, because the social demands of school-age children more widespread and children's experience of situations that can arouse emotions will be more diverse³, the emotional response

displayed by children is also different. Emotions of school-age children in the form of anger that may not be explosive anymore but packaged in other forms such as sulking, grumbling, nagging, protesting and so on⁴. The location of the difference is in the causes of the emergence of emotional reactions and how to express them.⁵ Emotions are actually prevalent in school-age children, but because of the large stressors in school and the child's ability to solve the problem is still limited, children need more guidance and practice controlling their emotions.

Based on the results of the 2007 Basic Health Research (Riskesdas), the prevalence of emotional mental disorders in Indonesia's population aged > 15 years was 11.6% and predicted in 2020 to be 15%.⁶ Based on the current research involving 161 research subjects in adolescents, 33.5% experienced emotional problems.⁷ Based on research on junior high school students in Semarang as much as 14.3% of students experienced

mental emotional problems.⁸ The cases of violence and beatings of students against teacher commonly occurred showed that there was a need for attention from the authorities so that the persecution carried out by students against teachers could be prevented.

One effort to overcome and emotional control of children is to provide assertive training in controlling emotions. Assertive communication is communication that encourages a person to develop optimally, both physically and psychologically, containing clear, positive, open, trustworthy and non-judgmental messages.⁹ Previous research shows that children's ability to manage their emotions can be improved by communicating with children.¹⁰

Method

The design of this study was a quasi-experimental with a randomized control group pretest and posttest design. In this design a group of subjects selected from certain populations were grouped randomly into two

groups, the intervention and the control group.

Population

The population in this study were all students of Vocational High School Gunung Sari 1 and 2 in Makassar.

Sample

Sample in this study was limited to students Class X of Vocational High School Gunung Sari 1 and 2 selected by simple random sampling who had met the inclusion and exclusion criteria, as many as 60 subjects, grouped into two groups consist of 39 subjects in the intervention groups and 21 subjects in the control groups.

Results

Results of Descriptive Analysis

Characteristics of respondents detailed can be seen in Table 1 and Table 2.

Table 1. Characteristics of Respondents (n = 60)

Characteristics Respondents	Control Group (n = 21)		Intervention Group (n = 39)		Total	
	n	%	n	%	N	%
Living stay with						
Parents	15	71.4	30	76.9	45	75.0
Family	5	23.8	6	15.4	11	18.3
Rental house	1	4.8	3	7.7	4	6.7
Mother's Education Level						
Elementary	7	33.3	16	41.0	23	38.4
Yunior high	5	23.8	3	7.7	8	13.3
Senior high	9	42.9	18	46.2	27	45.0
Colleges	0	0.0	2	5.1	2	3.3
Father's Education Level						
Elementary	5	23.8	14	35.9	19	31.6
Yunior high	2	9.5	2	5.1	4	6.7
Senior high	14	66.7	20	51.3	34	56.7
Colleges	0	0.0	3	7.7	3	5.0

Table 1 showed that most respondents living with their parents (75.0%). The largest proportion was found in the intervention group (76.9%) while in the control group (71.4%).

Table 2. Distribution of Respondents by Number of Siblings (n = 60)

Number of Siblings	N	Mean	Median	SD	Min-Max	95% CI
Control Group	21	3.33	3.00	±1.95	1.00-9.00	2.44-4 , 22
intervention groups	39	3.84	3.00	±1.94	1.00-9.00	3.21-4.47
Total samples	60	3.66	3.00	±1.94	1.00-9.00	3.16 -4.16

Table 2 showed that the average number of siblings was 3.66 (95% CI: 3.16-4.16±1.94) range (1-9 siblings). The results of the interval estimation could be concluded that 95% were believed to be the average number of siblings of respondents between 3.16 to 4.16 persons.

Table 3. Distribution of Respondents based on Emotion Management Scores (n = 60)

Emotional Management	Control Groups (n = 21)	Intervention Groups (n = 39)	Total (n = 60)
Before Assertive Training			
Mean (SD)	104,14 (9.34)	107.10 (5.70)	106, 00 (7.25)
Median	105.00	106.00	105.50
Min - Max	87-128	96-119	87-128
95% CI	99.89-108.40	105, 25-108,95	104,19-107,94
After Training			
Session I			
Mean (SD)	10.81 (1.12)	10.51 (1.16)	10.62 (1.15)
Median	11.00	11 , 00	11.00
Min - Max	9-12	7-12	7-12
95% CI	10.30-11.32	10.13-10.89	10.32-10.91
Session II			
Mean (SD)	10.19 (10.00)	10.46 (1.27)	10.37 (1.30)
Median	10.00	11.00	11.00
Min - Max	8-12	6-12	6-12
95% CI	9.57-10.81	10 , 05-10.87	10.03-10.70
Session III			
Mean (SD)	9.57 (1.07)	9.74 (0.87)	9.87 (0.96)
Median	10.00	10.00	10.00
Min - Max	8-12	8-12	8-12
95% CI	9.08-10.06	9.74-10.3	9.62-10.12

Cont... Table 3. Distribution of Respondents based on Emotion Management Scores (n = 60)

Session IV			
Mean (SD)	10.29 (1.14)	10.97 (0.58)	10.73 (0.88)
Median	11.00	11.00	11.00
Min - Max	7-12	10-12	7-12
95% CI	9.76-10, 81	10.78-11.16	10.51-10.96
Total (Session I-IV)			
Mean (SD)	40.86 (3.35)	41.97 (2.80)	41.58 (3.02)
Median	41.00	43.00	43.00
Min - Max	36-46	33-46	33-46
95% CI	39 , 33-42.38	41.07-42.88	40.80-42.37

Table 3 showed the average emotional management score of adolescents in the control group before assertiveness training was 104.14 (95% CI:99.89-108.40±9.34). Whereas in the intervention group 107.10 (105.25-108.95±5.70) range (87-128). The results of the interval estimation could be concluded that 95% were believed to be the score of adolescent emotional management in the control group before assertiveness training 99.89-108.40.

After the session I assertive training, the average emotional management score was higher in the control group, which was (10.81±1.12), in the intervention group (10.51±1.16). After session II, in the intervention group was higher than the control group which was (10.46±1.27). After assertive training III, in the control group and intervention group decreased. Emotional management scores in the intervention group were (9.74±0.87) while the control group was (9.57±1.07). Emotional management scores had increased again after session IV training assertion. Emotional management

scores in the intervention group were (10.97±0.58) while the control group was (10.29±1.14).

The average emotional management score after the four-session training assertion was 41.58 (95% CI: 40.80-42.37±3.02). Emotional management scores between the control group and the intervention group were not much different. Emotional management scores in the control group (40.86±3.35) while in the intervention group (41.97±2.80) with range (33-46). The results of the interval estimation could be concluded that 95% were believed to be the score of adolescent emotional management after assertive training 40.80-42.37.

Inferential Analysis Results Inferential

Analysis was used to determine differences in emotional management between the control group and the intervention group before and after assertiveness training. This can be seen in Table 4.

Table 4. Differences in the management of adolescent emotions between the control and intervention groups

Management of emotional	group		P value
	control (n = 21)	intervention (n = 39)	
before assertive training	104.14 (±9.34)	107.10 (±5.70)	0.13
after training assertion	40.86 (±3.35)	41.97 (±2.80)	0.23

Table 4 showed the average emotional management score before assertive training in the control group was (104.14±9.34), for the emotional management score in the intervention group (107.10±5.70). The results of the statistical test concluded that there was no difference in the mean score of emotional management between the control group and the intervention group before assertive training carried out.

The mean emotional management score after training assertion in the control group was (40.86±3.35), in the intervention group was (41.97±2.80). The results of the statistical test concluded that there was no difference in the mean score of emotional management between the control group and the intervention group after assertive training carried out.

Discussion

Adolescent Emotion Management Ability Before Assertive Training.

The results of the study suggested that the average emotional management score before the *Assertiveness Training* in the control group was 106±7.25 (range 87-128). The interval estimation results could be concluded that 95% were believed to be score adolescent emotions before assertive training 104.19-107.94. Compared to standardization of emotional management score from the assessment instrument, this result shows sufficient ability (minimum was 96 and good if 144). This means that the results of descriptive analysis show students have sufficient ability to manage emotions, when assertive exercises have not been carried out.

This findings in line with Yosep Iyus, (2009) stated that the range of angry responses fluctuates along adaptive and maladaptive responses. At the assertive stage the client is able to express feelings of anger at others without hurting and giving relief to the individual while at the aggressive stage anger can begin to not be controlled by the client so that the client can act destructively accompanied by violence which ultimately the person will behave destructive and lose control of himself can hurt himself and others and also destruct the environment. Adolescent assertive behavior consists of two elements namely verbal and nonverbal, verbal elements include stating not knowing expressing attitudes or asking for help or maintaining rights and

expressing feelings while nonverbal elements include sound violence, fluency in saying words, eye contact, facial expressions, body expressions and distance during interaction.

The assertive learning process is largely determined by the presence of internal factors and external factors.¹¹ Internal factors are influenced by the emotional intelligence of individuals and also influenced by the state of the brain by one's emotions while external factors are emotional intelligence highly influenced by factors coming from outside that can influence individuals to change attitudes. For example the influence in groups or friends, attitudes and behaviors of students while in the school environment will be obedient to the rules and school policies as external influences of individuals, so the researchers suggest that the ability of students to manage emotions is still influenced by external factors such as regulation and school discipline, the influence of subject teachers, and class-handled teacher who tend to instill modesty values to behave and act so students feel their behavior is still monitored by the teacher as long as they are in the school environment. Assertive training approaches can develop student adaptive and effective coping mechanisms that can control themselves when there is a sense of discomfort or anxiety, physical and emotional stress in preventing violent behavior.

Ability to Manage Student Emotions After Assertiveness Training

The average score of emotional management after assertiveness training was 41.58 (95% CI: 40.80-42.37±3.02) with range (33-46). Data analysis based on the stages of assertiveness training from session one to session three, average emotional management scores sustained where the average score of the session was one session 10.62, session two was 10.37 session three was 9.87 but in session four there was an increase in score of 10.73 with range (7-12). If it compares with the standardized assessment of the score in the instrument guideline range (6-12), meaning that students have been able to absorb emotions well.

This is in line with the previous theory¹² that controlling violent behavior is strongly influenced by emotional intelligence (*emotional intelligence*) where individuals are able to recognize their own feelings and other people's feelings. The ability to motivate

themselves and the ability to manage emotions well, both to themselves and in relation to others. Emotional intelligence can place one's emotions in the right portion by choosing satisfaction and regulating mood so that mood coordination is at the core of a good social relationship. When related to descriptive data analysis of the characteristics of respondents, it shows that out of 60 students there are 45 people (75%) choose to live with parents, this means that children who are under parental supervision were more controlled because parents can supervise children even though they are outside home or at school, so that if the child is going to commit deviant behavior such as participating in a group or juvenile delinquency community, the school will easily carry out supervision and communication to the parents as the person closest to the child, if the child does deviant activities from school norms, fear of violating children because of coordination and supervision between parents and the school.

Analysis of Differences Before and After Asserting Training

The average emotional management score before assertiveness training in the control group was 104.14 ± 9.34 , and in the intervention group was 107.10 ± 5.70 . The results of statistical tests using the test *Mann-Whitney* showed no difference in emotional management ability before and after training $p\text{-value} = 0.13 > \alpha = 0.05$.

The mean emotional management score after assertiveness training in the control group was (40.86 ± 3.35) , and in the intervention group was (41.97 ± 2.80) . The results of the statistical test concluded that there was no difference in the ability to manage emotions of students before and after training where a significant $p\text{-value} = 0.23 > \alpha = 0.05$.

This result is in line with the theory of Alberti and Emmons (1971) stated that assertive behavior implies a feeling of comfort, an exercise in maintaining a correct opinion of others.¹³ One of factors needed to be considered regarding this result is the characteristics of the respondents 75% were still lived with parents with education level commonly 50% have a high school education level. Educated parents are capable of forming better children's behavior, and the influence of parenting styles can also shape character, mentality and

personality to prevent deviant behavior, especially the risk of committing violent behavior in children.

Researchers suggest that assertive training can not be done in a short time, when students are still in the environment of learning atmosphere in school, which gives the impression that students feel supervised by teachers so that the behavior shown tend to perform good behavior. Therefore this research still needs to be developed with more complete training sessions.

Conclusion

Students have sufficient ability to manage emotions before assertiveness training. There is an increase in students' ability to manage emotions after assertiveness training, especially in session IV (fourth). There was no difference in students' ability to manage emotions before and after assertiveness training both the control group and the intervention group. For the effectiveness of assertiveness training, it is recommended that assertive training should be programmed regularly out of the student learning schedule in the school. This research still needs to be continued and developed with more complete training sessions in order to obtain maximum results.

Conflict of Interest: There was no conflict of interest regarding this study and publication.

Ethical Clearance: This study has been ethically approved and allowed by the Regional Investment and Coordination Board of South Sulawesi in Makassar.

Source of Funding: This study was funded by Health Polytechnic of Ministry of Health in Makassar, Republic Indonesia.

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The Effect of the Proposed Assisted Instrument (Horizontal Bar) in Teaching the Skill of a Small Back Course on the Horizontal Bar

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Abstract

The importance of the research lies in placing an assistant device in education under the hands of teachers of gymnastics and remove towards wide open areas for manufacturing devices and means to facilitate and accelerate kinetic learning Especially in teaching gymnastic movements for students of colleges of physical education and sports science because their physical and kinetic characteristics, their physical measurements and their relatively advanced ages make it difficult to teach these movements the problem of research lies in the difficulty of learning and performing the skill of the small background course on the horizontal bar the second grade students in the College of Physical Education resulting from the lack of appropriate kinetic energy and the friction between the two hand grips with the horizontal bar which obstructing the rotation of the beginner, thus the small cycle was not completed, so the researchers seen that it was necessary to facilitate the rotation by making the horizontal bar rotatable.

Keywords: horizontal bar; teaching; small back course; Skills

Introduction

Gymnastics consider an essential device for preparing for tournaments or entrance to reach the advanced level of performing the movements on the various legal devices in a correct and well-executed performance in accordance with the law the horizontal bar is also one of the favorite and popular devices among players because of its aesthetic and splendor in its movements, as training on the horizontal bar achieves some goals such as developing courage, agility, perfected performance, developing strength and controlling body balance and other physical and motor characteristics ⁽¹⁾.

One of the important methodological movements in colleges of physical education is the movement of the small background cycle movement on the horizontal bar, a movement that is performed from the front pivot and requires access to kinetic energy and

reduces friction of the hands with the horizontal bar. The importance of the research lies in putting an assistive device in education under the hands of teachers of gymnastics, and moving towards opening wide areas for manufacturing devices and means to facilitate and accelerate kinetic learning, especially in teaching gymnastic movements for students of colleges of physical education and sports science because their physical and kinetic characteristics, their physical measurements and their relatively advanced ages make it difficult to teach these movements ⁽²⁾.

Research problem

Due to the difficulty of learning and performing the skill of the small back course on the mind machine by the second grade students in the College of Physical Education resulting from the lack of adequate kinetic energy and from the friction between the two hand grips with the horizontal bar that prevents the rotation of the beginner and thus the incomplete small cycle, so the researchers seen that it was necessary to facilitate the rotation by making the horizontal bar rotatable.

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Research Objectives

The research aims to:

- 1- Manufacturing a low-horizontal bar educational device with a rotating keel.
- 2- Knowing the effect of the proposed device on teaching the skill of the small back course.

Research hypotheses

- 1- The proposed device has a positive effect in teaching the skill of the small background course.

Research Areas

1 The human field: Second graders / College of Physical Education and Sports Science - University of Qadisiyah.

2 Time domain: The period from 20/2/2017 to 20/4/2017.

3 Spatial domain: Gymnastic hall in the College of Physical Education and Sports Science - University of Qadisiyah

Research methodology and field procedures**Research methodology**

The experimental method was used that is appropriate to the nature of the research.

Society and research sample

The research community included students of the College of Physical Education / University of Qadisiyah - the second stage as it was chosen intentionally and was chosen (the second section -C) and (the second section) and by simple random way, the first group (the second section -C) (experimental) (15 Student, subject to the experimental variable (proposed device) which prepared by researchers, while the second group (control) (15) students, it was (the second section), subject to the practice of the traditional approach (low - horizontal bar), and after that homogeneity was performed for each group by using the law of coefficient of difference in length, age and mass variables all values less than (30%) were appeared. The two groups are homogeneous, as shown in Tables (1) and (2) and then equivalence between the experimental and control groups was performed by using the T-law for independent samples and all values were not significant, meaning that the two samples are equivalent in these variables as in Table (3).

Table (1) shows the homogeneity of the experimental group

No.	Variables	Mean	Standard deviation	CV
1	Height (cm)	171,33	5,58	3,25%
2	Age (years)	21,33	1,43	6,70%
3	Mass (kg)	72,75	7,45	11,61%

Table (2) shows the homogeneity of the control group

No.	Variables	Mean	Standard deviation	CV
1	Height (cm)	171,25	5,64	3,29%
2	Age (years)	21,25	1,13	5,31%
3	Mass (kg)	74	7,38	9,97%

Table (3) Shows the equivalence of the experimental and control groups in the researched variables

No.	Variables	Measurement units	Experimental group		Control group		The value of calculated T	Significance
			SM	SD	SM	SD		
1	Height	cm	171,33	3,54	171,25	5,64	0,03	Not significant
2	Age	years	21,33	1,43	21,25	1,13	0,33	Not significant
3	Mass	kg	72,75	8,45	74	7,38	0,38	Not significant

* The value of (T) (1.76) at the significance level (0.05) and under temperature (28).

Tools, Means, and Devices Used in the Research:

Research tools

Researchers used the following research tools:

- 1- Note.
- 2- Personal interviews¹
- 3-A form for collecting degrees for research students (Recording the results of the performance skills of students)

Devices and means used in the research:

The researchers used the following research devices:

- Horizontal bar device (has a rotating keel)
- Medical scale to measure lengths and weights
- Sony camera to shoot skilled performance.
- Spongy rugs

Device used to search:

- The horizontal bar device was used to identical to the legal specifications horizontal bar which is as follows: -
- The horizontal bar has internationally approved legal measures and as follows:
- The height of the educational low - horizontal bar is

170 cm above the ground

- The length of the keel is (240) cm.
- The diameter of the keel is (28) mm.
- The distance between each fastening parallel to the keel is (550) cm.
- The distance between each two posts fixed to the keel is (4) m.
- The distance between the square and the connecting line between the two vertical posts on the keel is (155) cm.
- Diameter of square keel is (2) inch.

Note: Iron joints have been added to the horizontal bar from both sides (Polburn) to facilitate movement during the performance of the skill, so that at the end of the keel an iron blocker which allowed to move the keel of the half-turn or a full turn while performing the required skill.



Figure (1): shows the device manufacturing experience;



Figure (2): Shows the performance of the small cycle on the rotating horizontal bar

Exploratory experience:

The researchers conducted the exploratory experiment on a sample consisting of (4) students from outside the research sample. The exploratory experiment was

held on Tuesday 5/2/2016 at half past ten and the experiment aimed to the following:

- 1- Identify the suitability of the device for the sample.
- 2- Ensure the readiness of tools

3- Knowing the time it takes to perform each student in addition to the total time.

Field research procedures:

- The skill was taught to the experimental and control groups on the horizontal bar device by two educational units and then the pre-test for the two groups was conducted and the scores were set by four residents, when performing the skill, and then the educational (proposed) system was used for the Experimental group, and the control group was learned the skill on the low horizontal bar device and after the two groups worked on the devices with four educational units, by two units per week, the researchers conducted the post-test of the two groups, and the scores were set by the arbitrators.

The main experience:

After confirming the possibility of working on the manufactured device the experimental group was started to teach the skill of the small background course and It was as planned to allocate the first two educational units with the rotation of the keel with the learner movement approximately one full cycle (more than 270 degrees), and the third unit was the rotation of the keel (180 degrees The fourth educational unit was to install the keel just like the device used for the control group.

Post-test

After completing the educational units of the two research groups, the post-test was conducted on 20/2/2016 as the skill performance was filmed and converted on CD and delivered to specialized residents. To assess the skill performance, the evaluation score was of 10 degrees, the highest and lowest grades were omitted, and the mean of the two mean scores was approved.

Statistical means

The SPSS statistic bag was used to process the collected data based on the following laws:

- 1- Mean
- 2- Standard deviation (SD)
- 3- Coefficient of variation
- 4- (T) test for independent samples

Present the results, analysis and discussions

3-1 Presentation, analysis and discussion of the results of the pre-test and the difference between the two groups in the pre-test.

Table (4) Shows the values of mean, the standard deviations, the calculated value of T, the level of significance, and the type of difference between the experimental and control groups in the pre-test.

Coefficient Skill	Control group		Experimental group		Calculated value of T	Significance level	Kind of difference
	SM	SD	SM	SD			
Small background cycle	1,46	0,74	1,53	0,91	0,21	0,828	Not significant

From the above table shows that the value of the significance level of 0.828 is greater than 0.05, and this indicates that there were no significant differences between the experimental and control groups in the pre-test to perform the skill of the small background course,

and this confirms the equivalence of the two groups. 2-3 Presentation, analysis and discussion of the results of the pre and posttests of the two groups in the skillful performance of the skill of the small background course on the horizontal bar.

Table (5) Shows the values of mean, the standard deviations, the calculated value of T, the level of significance, and the type of difference between the pre and posttests of the experimental and control groups.

Variables	Pre-test		Post-test		Calculated value of T	Significance level	Kind of difference
	SM	SD	SM	SD			
Experimental group	1,53	0,91	5,466	1,302	6,487	0,00	significant
Control group	1,46	0,74	4,2	0,941	7,643	0,00	significant

From Table (5) above it shows that the two levels of significance level in the pre and post-tests of the experimental and control groups have reached 0.00 which is less than 0.05 and this indicates that there are significant differences between the pre and post tests and in favor of the post- test (for both groups), and the reason for that is due to the fulfillment of the conditions for learning the skill , which includes readiness and motivation, the most important of which is the practice that in turn led to building the initial Kinetic program and then continuing the performance accompanied by feedback and correction, especially the preparatory section by performing the weighted legs of the two legs to the upper back to obtain a speed that helps the learner to rotate on the keel, which represents the axis of rotation.

3-3 Presentation, analysis and discussion of the results of the post- test and the differences between the two groups in the skillful performance of the skill of the small background course on the horizontal bar.

Table (6) Shows the values of mean, the standard deviations, the calculated value of T, the significance level, and the type of difference between the experimental and control groups in the post test.

Coefficient Skill	Control group		Experimental group		Calculated value of T	Significance level	Kind of difference
	SM	SD	SM	SD			
Small background cycle	4,2	0,941	5,466	1,302	3,054	0,005	significant

From Table (6) above shows that the value of the significance level of 0.005 is smaller than 0.05 and this indicates that there were significant differences between the experimental and control groups and these differences for the benefit experimental group with the largest mean, and this is due to the use of the proposed device that was working to reduce Friction between the hand of the beginner and the horizontal bar (the amounts of the frictional force depend on the nature of the contact surfaces) ⁽¹⁾. In the second educational unit in which the proposed device was used, the rotating keel

was approximately 350 degrees and the educational units that followed it had a 180 degree rotation range, while the keel is installed and not rotating it in the last educational unit, which dealt with the problem of friction coefficient which (making the shoulder speed backward less than the speed of the legs moving forward and is one of the expected errors of performance) ⁽²⁾, and thus the members of the experimental group were taught the rotation easily, then the focus was on not having to distance the center of body mass from the beam after the weighted ⁽³⁻⁷⁾.

Conclusions

Conclusions

- 1 - An important factor in performing rotation on the horizontal bar is to reduce friction.
- 2 - The rotating keel facilitates the skill learning process in terms of guiding the learner to realize the skill requirements.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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Incidence of Malignant Neck Masses (MNMs) in Fallujah District , Iraq; Descriptive Cross Sectional Study 2017-2018

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Abstract

Background: Cancer is one of a major health problem all over the world ,the main factor obstacle facing cancer prevention in our country is a deficiency of epidemiological studies to guide local or international efforts for disease control .

Objective: To determine the incidence & risk factors of malignant neck mass in Fallujah District , Anbar province , Iraq .

Methods: Proper history include the age , gender , occupation , residence and physical examination include inspection , palpation, auscultation , imaging as ultrasound , chest X-ray , CT scan , Pet scan and in some case Thyroid scan , then Close diagnostic interventions as FNAC, Core –Cut biopsy or Open diagnostic intervention like Incisional ,excisional biopsy were taken from patients with neck mass admitted to surgical unit of Fallujah Teaching Hospital(FTH).

Results: Of 207 neck mass cases admitted to surgical unit of FTH , 123 cases (59.42%) was malignant neck masses including 53 (43.08%) and 70 (56.91%) recorded in 2017and 2018 respectively. The incidence of malignant neck masses in FTH were 8.26 and 10.91 in 2017& 2018 per 100,000 person per year respectively. Lymphoma considered as a most common MNMs 46 (37.39%) followed by Thyroid cancer 45 (36.58%) , Carcinoma of unknown origin 20 (16.26%) and other type of MNMs 12 (9.75%).

Conclusion: The incidence of MNMs in Fallujah Teaching Hospital were 8.26 and 10.91 in 2017& 2018 per 100,000 respectively and lymphoma were the most common MNMs.

Keyword: Malignant Neck Mass, Incidence, Fallujah , Iraq.

Introduction

Neck masses are common in adults, but often the underlying etiology is not easily identifiable, while infections most common cause of the neck masses in children. Evidence suggests that a neck mass in the

adult patient should be considered malignant until proven otherwise ^{1,2}. Importantly, an asymptomatic neck mass may be the initial or only clinically apparent manifestation of head and neck cancer, such as squamous cell carcinoma (SCC), lymphoma, thyroid, or salivary gland cancer^{2,3}.

Timely diagnosis of a neck mass due to metastatic SCC is paramount because delayed diagnosis directly affects tumor stage and worsens prognosis. Unfortunately, despite substantial advances in testing

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modalities over the last few decades, diagnostic delays are common ⁴.

Accurate picture of the demographic and epidemiological profile of neck masses is fundamental for diagnosis, like in the present retrospective analysis each age group showed a frequency for certain diseases, and this can be a guide for ranking differential diagnosis ⁵. The present study are design to determine the incidence and risk factors of malignant neck mass in Fallujah District , Anbar province , Iraq

Methods

A descriptive cross-sectional study was conducted in FTH , Surgery unit during a period between 1st of January 2017 to last day of December 2018. Fallujah region is located in the east of Al-Anbar governorate, Iraq. In Our study divided the Fallujah District into two part central and peripheral (Amerya, Karma ,and Saqlawya). In 2017 - 2018 the total population of Fallujah was estimated as 641,143 person based on report from Fallujah Office of registration, Ministry of planning including 333,880 person of Central of City and 307,263 person of Peripheral of City .

The number of operations that admitted to Surgery unit of FTH are 5650 and 5858 in 2017 and 2018 respectively (total 11508), every month about 479 cases, every day about 16 cases.

Total neck mass 207 (98 , 109 in 2017, 2018 respectively), only 123 case as MNMs were include in this study (53 cases 43.08% , 70 cases 56.91% in 2017 and 2018 respectively).

The diagnostics have relied on them in neck mass depending on taken proper history include the

age , gender , occupation , residence and physical examination include inspection , palpation, auscultation , imaging as ultrasound , chest X-ray , CT scan , Pet scan and in some case Thyroid scan , then diagnostic interventions as FNAC, Core –Cut biopsy or Open diagnostic intervention like Incisional ,excisional biopsy were taken from patients with neck mass admitted to surgical unit of FTH. Informed consent were taken from the patients , Ethical approval was granted by the scientific committee in FTH and Anbar medical college.

Results

Out of 207 neck mass examinations during two years, 123 (45.5%) patients were diagnosed as having MNMs. Fifty one were male (41.5%) and 72 were females (58.5%) giving a male/female 1:1.4

The range of age was from 4 years to 85 years. The mean age was (39.77±20.08 years). Most of the patients with MNMs presented in age group 41 – 60 (39.8%) followed by 21 – 40 (22%), 20.3% were in age group 61 – 80, while the remaining 17.1% and 0.8% were more than 81years and <= 20 respectively shown in Table 1.

Regarding the smoking, the study showed that 46 (37.4%), 26 (21.1%) of MNMs were passive and active smoker respectively while the other 51 (41.5) of MNMs were non smoke .There was no statistically significant between smoker and non- smoker of MNMs patients (Table 1).

The study showed that 86 (69.9%) of MNMs patients were refugee and only 10 (8.1%) of MNMs patients exposure to radiation and 66 (53.7) of those patient live in the peripheral of City while the other 57 (46.3) live in the Central of City (Table 1).

Table 1. Socio-demographic characteristics and risk factors of MNMs patients

Character	No.,(%)	Character	No. (%)	
Age	39.77±20.08	Age Group		
		<= 20	1 (0.8)	
		21 - 40	27 (22)	
		41 - 60	49 (39.8)	
		61 - 80	25 (20.3)	
		81+	21 (17.1)	
Gender		Occupation		
Female	72 (58.5)		Farmer	21 (17.1)
Male	51(41.5)		Teacher	11 (8.9)
			Painter	2 (1.6)
Smoker		Military	17 (13.8)	
		Student	24 (19.5)	
		Child	3 (2.4)	
		House wife	45 (36.6)	
Active	26 (21.1)	Radiation exposure		
Passive	46 (37.4)		No	113 (91.9)
Non	51 (41.5)		Yes	10 (8.1)
Migrated (Refugee)		Residence		
No	37 (30.1)		Central of City	57 (46.3)
Yes	86 (69.9)	Peripheral of City	66 (53.7)	

The incidence of MNMs were 19.18 Pearson per year/ per 100,000 person during 2017-2018. Of them 8.89 in Central of City while 10.29 in peripheral of City.

In our present study, the diagnostic and interventions tools mentioned in Table3 were used in the diagnosis of MNMs.

Table 2: Imaging modality and Diagnostic interventions of malignant neck mass.

Imaging modality and Diagnostic interventions	Responses
	No. (%)
Ultrasound	117 (24.2%)
Chest X-ray	99 (20.5%)
CT SCAN of Neck and Chest	65 (13.4%)
THYROID SCAN	29 (6.0%)
PETSCAN	15 (3.1%)
Fine Needle Aspiration Cytology	27 (5.6%)
Core biopsy	45 (9.3%)
Incisional biopsy	29 (6.0%)
Excisional biopsy	58 (12.0%)

Lymph nodes and thyroid considered as a most common organ origin 52(42.3%) and 42 (34.1%) respectively . Of them 98 (79.7%) Primary site origin and 40(32.5) anterior / Central anatomical site. Sixty seven (54.5%) of MNMs were Painless while the others 56(45.5%) Painful mass as shown in table 3.

Table 3: Frequency of malignant neck mass according to organ origin, site origin ,anatomical site and clinical feature

Character	N (%)	Character	N (%)
Organ Origin		Site origin	
skin	6(4.9)	Primary	98 (79.7)
Muscles	1(0.8)	Secondary	25 (20.3)
Thyroid	42(34.1)		
Lymph nodes	52(42.3)	Anatomical site	
Salivary gland	2(1.6)	Anterior / Central	40(32.5)
Vascular	1(0.8)	Lateral right	38(30.9)
Bone	1(0.8)	lateral left	36 (29.3)
Esophagus	1(0.8)	Posterior	9(7.3)
Larynx	3(2.4)		
Pharynx	2 (1.6)	Clinical feature	
Lung	4(3.3)	Painless mass	67(54.5)
parotid	8(6.5)	Painful mass	56(45.5)

There was statistically significant in anatomical site of MNMs between male and female (P. Value <0.00). There were non- statistically significant of MNMs between male and female regarding neck mass association with viral infection, site origin and clinical feature (Table 4).

Table 4 . Association of gender with certain characteristics of malignant neck masses.

Character Female No.		Gender		P. Value
		Male No.		
Anatomical site	Anterior / central	33	7	<0.00
	Lateral right	13	25	
	lateral left	23	13	
	Posterior	3	6	
Neck mass association with viral infection	No	53	34	0.4
	Yes	19	17	
Site origin	Primary	62	36	0.035
	Secondary	10	15	
Clinical feature	painless	44	23	0.079
	painful	28	28	

Regarding distribution of tumor type of MNMs in male and female, the study showed that only papillary carcinoma were most common in female than male (P.Value = 0.000) whereas the other type of MNMs were not statistically significant between male and female as shown in Table 5.

Table 5. Tumor type of malignant neck mass by Gender

Tumor Type	Female N (%)	Male N(%)	P.Value
Papillary Carcinoma	31 (25.2)	5 (4.1)	0.000
Hodgkin's lymphoma	13 (10.6)	19 (15.4)	0.289
Carcinoma of unknown origin	9 (7.3)	11 (8.9)	0.655
Non-Hodgkin's lymphoma	7 (5.7)	7 (5.7)	1.000
Follicular thyroid carcinoma	6 (4.9)	0	-
Squamous cell carcinoma	2 (1.6)	3 (2.4)	0.655
Rabdomyosarcoma	1 (0.8)	0	-
Bone clavicular tumor sarcoma	1 (0.8)	0	-
Bronchogenic carcinoma	1 (0.8)	3 (2.4)	0.317
Anaplastic thyroid carcinoma	1 (0.8)	2 (1.6)	0.564
Carotid body tumor	0	1 (0.8)	-
Total	72 (58.5)	51 (41.5)	0.058

Regarding distribution of MNMs depending on anatomical site, the study showed that occupation of MNMs patients were statistically significant in anatomical site (P.Value = 0.000) whereas the residence and Smoking habit

not associated with anatomical site (Table 6).

Table 6. Association between, residency , occupation and smoking habit of malignant neck mass regarding anatomical Site.

Anterior / central N (%)		Anatomical Site				P .Value
		Lateral right	lateral left	Posterior		
		N (%)	N (%)	N (%)		
Residence	Central of City	20 (35.1)	16(28.1)	18(31.6)	3(5.3)	0.72
	Peripheral of City.	20(30.3)	22(33.3)	18(27.3)	6(9.1)	
Occupation	Farmer	4(19)	11(52)	6(28.6)	0(0)	0.000
	Teacher	8(72)	2(18.2)	1(9.1)	0(0)	
	Painter	0(0)	0(0)	2(100)	0(0)	
	Military	3(17.6)	10(58.8)	2(11.8)	2(11.8)	
	Student	4(16.7)	3(12.5)	12(50)	5(20.8)	
	Child	0(0)	1(33.3)	2(66.7)	0(0)	
Smoking habit	House wife	21(46.7)	11(24.4)	11(24.4)	2(4.4)	0.50
	Active	6 (23.1)	12(46.2)	7(26.9)	1(3.8)	
	Passive	16(34.8)	13(28.3)	12(26.1)	5(10.9)	
	Non	18(35.3)	13(25.5)	17(33.3)	3(5.9)	

Discussion

This is the first report concerning MNMs incidence in Fallujah region, the evaluation of neck masses is often challenging for health care providers. Present study that showed MNMs increase with ages, and the incidence rate was similar to incidence of all cancer of the other studies in the west of Iraq ⁶ and in the Middle East ⁷, this may reflect prevalence of risk factors coupled with an increase in life expectancy, and may reflect long term changes in the life style.

The present study showed no association of MNMs with smoking, it was agreement with previous study⁸. Radiation exposure was 10 (8.1%) of patients with MNMs was expected, as radiation exposure is a

common cause of head and neck cancers ⁹. This low finding in our study may due to low knowledge about the radiation affect by population, and miss leading by personal thinking.

Present study showed there were increasing in the incidence of MNMs Fallujah during 2017- 2018 and these may be due developing in registration system, or may related to same factors that lead to increasing in congenital anomalies in Iraq post USA attack which approved to be radiation effect as described previously ^{10, 11, 12, 13}.

Malignant neck mass incidence was higher in Fallujah periphery sub districts 10.29 per 100,000 population than its center 8.89/100,000, this is probably

due to migrated of center population with history of exposure to periphery of city ,late affect pollution , accumulation of end product of population and exposure of Fallujah periphery to more military operations and battles than its Center in last 15 years .

Core biopsy is an option after an initial inadequate or indeterminate FNA. In a meta-analysis, ultrasound-guided core biopsy was shown to have a high rate of adequacy (95%) and high accuracy (94% and 96%) in detection of neoplasia and malignancy, respectively as well as a low rate of complications (1%)¹⁴ .

Tru-Cut biopsy in 45(36.6%) it was done while 78(63.4%) it was not done, frequency used Tru-Cut biopsies to take tissue biopsy specially in diagnosis of Lymph node tumor has gradually increased that agreement with other study¹⁵ .

In present study Incisional biopsy 29 (23.6%) it was done while 94(76.4%) it was not done. Excisional biopsy 58(47.2%) it was done while 65(52.8%) It was not done However, the tissue-healing time is longer after an open biopsy when compared with a needle biopsy, in cases of malignancy, so initiation of treatment may be delayed¹⁶ .

Total excision of the MNMs is often preferred in undiagnosed cases for both diagnostic and therapeutic purposes as agreement with another study¹⁷ . Primary (neck) 98(79.7%) , secondary 25 (20.3%), most aetiology of MNMS from structures in neck like LN, thyroid , and still metastasis another cause, these findings are similar to the previous research metastasis to head and neck area in Iran¹⁸., these results was consistent also with the result reported by Sadri et¹⁹ as seen in table 3

The incidence of MNMs in this study was higher in lateral masses when compared with the anterior site of the neck that agreement with a previous reference and research²⁰ . Although, in this study according symptomatology of MNMs present with painful masses in 56 cases (45.5%) while 67 cases (54.5%) not associated with pain, still Patient history and physical examination are fundamental to making an early and correct diagnosis.

Our study was in agreement with other reports that showed the majority of the thyroid carcinomas in the

present review were papillary thyroid carcinoma²¹ .

Although this study is deal with a small group number of cases ,we believe it shed some high light on incidence and the pattern of common MNMs in this region.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

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Comparison of Efficacy of Dipeptidyl Peptidase-4-Inhibitor Versus Sulfonylureas in Type 2 Diabetes Patients Inadequately Controlled with Metformin; A Narrative Review

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Abstract

Objectives: The aim of this review is to evaluate efficacy of Dipeptidyl peptidase-IV-inhibitor (DPP-4 inhibitors) compared to sulfonylureas (SU) in type two diabetes patients who were not adequately controlled with metformin.

Method: Relevant articles were identified from PubMed, Scopus, Cochrane, Embase and some journals websites, all studies published between 2007 until 2018 were included. Key words used were: Dipeptidyl peptidase-IV-inhibitor, sulfonylurea, efficacy and cardiovascular. Both RCTs and Non- RCTs studies were included

Results: Most of the studies that evaluated glycosylated hemoglobin (HbA1c) and fasting plasma glucose reduction between SU and DPP-4 inhibitors revealed almost similar reduction rate. Accumulating evidences showed no statistically significant difference between the two groups. Few studies claimed that SU had better HbA1c reduction rate, however, with minimal significance.

In addition, evidence showed no significant effect on HDL or LDL. Sitagliptin associated with -5.3% decreased in triglyceride level compared to 2.1% increased with glimepiride, resulting in a between-group difference of -6.1% (-10.4, -1.7), favoring sitagliptin.

DPP-4 inhibitors added to metformin may be associated with fewer macrovascular complications compare to SU combination with metformin.

Conclusion: It seems that DPP-4 inhibitors and SU has comparable glycemic control and overall efficacy with no significant effect on HDL or LDL and slight effect on TG. DPP-4 inhibitors combination showed fewer macrovascular complications.

Keywords: Dipeptidyl peptidase-IV-inhibitor, sulfonylurea, efficacy, cardiovascular, Metformin.

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Introduction

Diabetes mellitus (DM) is one of the most prevalent diseases worldwide, in 2017 the International Diabetes Federation estimated that diabetes affects around 425 million, or 8.8% of adults with age of 20-79 years around the globe.⁽¹⁾ Type 2 DM (T2DM) accounts for 90% of the diabetes cases.⁽²⁻⁴⁾ It affects 11.3 % in persons age 20 or older in US.⁽⁵⁾ Metformin concurrently

with life style modification is considered the first line initial therapy for T2DM as recommended by American Diabetes Association, American association of clinical endocrinologist and other guidelines.⁽⁶⁻⁹⁾ The guidelines recommend adding another antidiabetic agent to metformin if the patients still not achieving their glycemic goals after three months despite maximization of metformin or when HbA1c is higher than or equal to 9%.^(6, 9) If the patient doesn't have atherosclerotic cardiovascular disease (CVD) the clinician should add one of the following classes to metformin, either sulfonylurea (SU), basal insulin, glucagon-like peptide-1 (GLP-1) agonists, Thiazolidinedione, Dipeptidyl peptidase-4 inhibitors (DPP-4 inhibitor), or sodium glucose cotransporter 2 inhibitors (SGLT2 inhibitor). The selection of which medication to be added is depend on patient centered approach including evaluation of efficacy, hypoglycemia risk, effect on weight, adverse effects, costs, and patient preferences.⁽⁶⁾ If the patient has T2DM and atherosclerotic CVD it's recommended to add an agent with confirmed CV benefit e.g. empagliflozin and liraglutide.^(6, 10, 11)

As explained above either class can be used as add on to metformin (if tolerated). SU has been used the most in the past decades and until now some clinicians prefer to prescribe them because of the availability and low price. In the last ten-year DPP-4 inhibitors has been emerged in the clinical practice as add on to metformin due to acceptable efficacy and low side effect rate compared to SU. The aim of this article is to compare the efficacy of SU versus DPP-4 inhibitors in patients not adequately controlled with metformin.

Materials and Method

Literature search were conducted to identify relevant articles using PubMed, Scopus, Cochrane, Embase and some journals websites, all studies that compare efficacy of DPP-4 inhibitors versus sulfonylurea in type two diabetes patients inadequately treated with metformin were included. All studies published between 2007 until 2018 were included. Key words used; Dipeptidyl peptidase-IV-inhibitor, sulfonylurea, efficacy and cardiovascular. Studies were included if they were peer reviewed, published in English, compare efficacy of the two medication classes, both RCTs and Non- RCTs studies were included. Studies that

did not match inclusion criteria were excluded. Two independent investigators identified and assessed studies for eligibility (MA, AE) and another two investigators verified the included articles (MA, OA). For each study, efficacy parameters extracted.

Results and Discussion

Efficacy:

Glycosylated hemoglobin (HbA1c):

Most of the studies examined the reduction in HbA1c between different SU and DPP-4 inhibitors failed to identify significant difference between the two classes. However, three studies found that SU associated with better reduction in HbA1c than DPP-4 inhibitors. Gallwitz et al showed that the reduction in HbA1c with glimepiride was -0.36% compared to -0.16% with linagliptin resulting in a between group difference of 0.20% CI (0.09–0.30, P =0.0004) which is statistically significant but may not has a clinical significance.⁽¹²⁾ The other two studies revealed that glibenclamide and glimepiride was associated with a greater reduction in HbA1c compare to sitagliptin (-1.0%, -1.89% compared to -0.6%, -1.47% respectively, between group difference of {(0.4%, P =0.01), (-0.42, P < 0.05) respectively} which appeared to be clinically significant.^(13, 14)

On the other hand, five studies demonstrate that DPP-4 inhibitors associated with better reduction in HbA1c than SU. Although this difference was statistically significant in these studies, it has still considered very low and may not have clinical significance (between group difference less than 0.2%).⁽¹⁵⁻²⁰⁾ For instance Del Prato et al found that the reduction in HbA1c with alogliptin groups (12.5-25 mg) was statistically significant (-0.68%, -0.72%) compared to glipizide group -0.59%, resulting in a between group difference of (0.09%, 0.13%. P <0.001. Despite that these results may not has clinical significance.⁽¹⁷⁾ The other four trials found that the reduction in HbA1c with DPP-4 inhibitors groups was statistically significant (-0.7%, -0.41%, -0.54% and -0.5%) compared to SU group (-0.5%, -0.35 %, -0.51% and -0.4% respectively) resulting in a between group difference of (-0.2%, -0.05%, -0.03% and -0.1% respectively).^(15, 18-20)

Many studies failed to identify any statistically significant differences in HbA1c reduction between the two groups.⁽²¹⁻²⁸⁾

Fasting Plasma Glucose (FPG)

Overall, most studies that evaluated FPG showed no significant differences between SU and DPP-4 inhibitors in reducing FBG.^(14, 18-22, 24, 25, 27-31) On the other hand, two randomized clinical trials (RCTs) found that SU

associated with better reduction in FBG compared to DPP-4 inhibitors.^(12, 13) One study compared linagliptin to glimepiride found a significant decrease in FPG with glimepiride compared to linagliptin (-16.2 mg/dl, -7.56 mg/dl respectively. $P < 0.0001$

CI (4.32–10.89)).⁽¹²⁾ Another study found that glibenclamide was associated with a greater reduction in FPG compare to sitagliptin (- 31 ±36 mg/dL, - 13 ±51 mg/dL, $P = 0.02$. respectively) (Table-1).⁽¹³⁾

(Table-1) Studies that addressed Fasting Plasma Glucose change in DPP-4 inhibitors plus Metformin user's vs SU plus Metformin users.

Studies (DPP-4 inhibitor VS SU)	Comparison of FPG change from baseline			
	DPP-4 inhibitor plus Metformin group	SU plus Metformin group	between group difference	P-value/95% CI
Goke et al (19) (saxagliptin vs Glipizide)	-12.5 mg/dl	-9.8 mg/dl	-2.7±2.8 mg/dl	CI (-8.1, 2.8)
Mathews et al (24) (vildagliptin vs glimepiride)	-9 mg/dl	-12.6 mg/dl	-3.6 mg/dl	P= 0.066
Arechavaleta et al (21) (sitagliptin vs glimepiride)	-14.4 mg/dl	-18 mg/dl	-3.6 mg/dl	CI (-1.8, 7.2)
Nauck et al (25) (sitagliptin vs Glipizide)	-10.0 mg/dl	-7.5 mg/dl	- 2.5 mg/dl	CI (-6.8, 1.9)
Seck Et al (20) (sitagliptin vs Glipizide)	-18 mg/dl	-20 mg/dl	-1.8 mg/dl	CI (-7.2, 3.6)
Jeon et al (30) (vildagliptin vs glimepiride)	-28 mg/dl	-39 mg/dl	-11 mg/dl	P=0.508
Filozof et al (22) (vildagliptin vs gliclazide)	-23 mg/dl	-27 mg/dl	-4 mg/dl	P = 0.257
Abrar et al (32) (sitagliptin vs glimepiride)	-57.2 mg/dl	-56.3 mg/dl	-0.9 mg/dl	P = 0.746
Derosa et al (18) (vildagliptin vs glimepiride)	-6 mg/dl	-6 mg/dl	0.00 mg/dl	P= 0.083
Anjoom et al (14) (sitagliptin vs glimepiride)	-42 mg/dl	-37 mg/dl	- 5 mg/dl	P > 0.05

DPP-4 inhibitor = Dipeptidyl peptidase-IV-inhibitor, CI = confidence interval, SU = Sulfonylurea

Postprandial Blood Glucose (PPG)

In general, few studies evaluated the effect of SU and DPP-4 inhibitors on postprandial glucose (PPG). Most of these studies failed to find a significant difference between these two classes.^(12, 18, 28, 30, 31) However, Three RCTs showed that DPP-4 inhibitors associated with better reduction in PPG than SU.^(14, 17, 23) Del Prato et al found that the reduction in PPG with alogliptin 12.5 and 25mg were 13 and 11.4 mg/dl respectively, which consider to be larger than the reduction with the glipizide 0.9 mg/dl, and both differences were significant ($p < 0.05$).⁽¹⁷⁾ Anjoom et al evaluated the PPG changes in sitagliptin group versus glimepiride group compared to the baseline, they found that considerable reduction in PPG was noticed with sitagliptin group compared to glimepiride group (58 mg/dl, 48 mg/dl respectively) $P < 0.05$.⁽¹⁴⁾

Lipid profile:

Few studies evaluated the effect of SU and DPP-4 inhibitors on lipid profile.^(13, 18, 20, 21, 25) Three RCTs studied the effect of these two agents on high-density lipoprotein (HDL), and they found that DPP-4 inhibitors associated with great increased in HDL compared to SU.^(20, 21, 25) Arechavaleta et al found that sitagliptin associated with a 4.4 % increase in baseline level for HDL-C compared to 0.9 % with glimepiride, resulting in a between group difference of 3.5% (95% CI):0.6, 6.5) favoring sitagliptin.⁽²¹⁾ The other two studies were compared sitagliptin to glipizide.^(20, 25) However, two studies showed that SU and DPP-4 inhibitors had no effect in HDL level.^(13, 18) These studies were compared sitagliptin to glibenclamide and vildagliptin to glimepiride respectively.

Few studies assessed the effect of SU and DPP-4 inhibitors on Triglyceride (TG).^(13, 18, 20, 21, 25) Arechavaleta et al found that sitagliptin associated with -5.3% decreased in TG level compared to 2.1% increased with glimepiride, resulting in a between-group difference of -6.1% (-10.4, -1.7), favoring sitagliptin.⁽²¹⁾ Another two studies which compared sitagliptin to glibenclamide and vildagliptin to glimepiride also found that DPP-4 inhibitors associated with better reduction in TG compared to SU.^(13, 18) On the other hand, few studies failed to find a significant difference in TG levels between the two classes.^(20, 25)

Most of the studies that examined the effect of SU and DPP-4 inhibitors on Low-density lipoprotein (LDL) level failed to find a significant difference between the two classes.^(13, 21, 25) Seck et al found that sitagliptin associated with a 7.4% increase in baseline level for LDL compared to 1.0% decreased with glipizide [between group difference (95% CI) = 8.4% (2.5, 14.3)].⁽²⁰⁾ However, Derosa et al found that vildagliptin was associated with a better reduction in LDL level compared to glimepiride P (0.044).⁽¹⁸⁾

Cardiovascular Effect

There is an insufficient data regarding the occurrence of diabetes macrovascular complications in patients using SU compared to DPP-4 inhibitors. Few studies assessed these complications and they found that DPP-4 inhibitors seem to be associated with fewer macrovascular complications compared to SU.^(12, 17, 27, 33, 34) Morgan et al studied the risk of major adverse cardiovascular events (MACE) and mortality for combination therapies with metformin and either SU or DPP-4 inhibitors.⁽³⁴⁾ The sample size of this study was around 40000 patients. In this study, DPP-4 inhibitors were associated with a significant reduction in the risk of all-cause mortality compared to SU 95% CI adjusted hazard ratio (aHR) 1.357, 95% CI (1.076–1.710, $p = 0.010$). In addition, there was a significant reduction in the risk of MACE (myocardial infarction or stroke) in patients treated with DPP-4 inhibitors versus those treated with SU aHR=1.710 (95% CI 1.280–2.285, $p < 0.001$). Also, Eriksson et al found that SU was associated with an incremental risk in of fatal and nonfatal CVD, and all-cause mortality compared with DPP-4 inhibitors, aHR (95% CI): 1.17 (1.01–1.37); and 1.25 (1.02–1.54) respectively.⁽³⁵⁾ Furthermore, Gallwitz et al found that linagliptin was associated with 12 cardiovascular events compared to 26 events with glimepiride (relative risk 0.46, 95% CI 0.23–0.91, $p = 0.0213$).⁽¹²⁾ However, the author of this study mention that may be the result happened by chance, because the study was neither planned nor powered for cardiovascular outcomes. Wang et AL, found that DPP-4 inhibitors associated with reduced significant reduction in the risk of nonfatal CV events, CVD mortality, and all-cause mortality compared to SU, pooled relative risk(RR) (95% CI): 0.71 (0.56–0.90), 0.58 (0.41–0.82) and 0.72 (0.59–0.87) respectively. However, the number of fatal CV events

was not significantly different between the two groups RR 1.001 (0.85–1.18).⁽³⁶⁾ On the other hand, SAVOR-TIMI 53, EXAMINE and TECOS trials assessed the cardiovascular effect of saxagliptin, alogliptin, and sitagliptin respectively compared to placebo, they found that these agents did not seem to increase or decrease in the risk of major adverse cardiovascular events.⁽³⁷⁻³⁹⁾ However, according to American Diabetes Association saxagliptin and alogliptin could be associated with potential risk for congestive heart failure.⁽⁶⁾

Conclusion

It seems that DPP-4 inhibitors and SU has comparable glycemic control and overall efficacy with no significant effect on HDL or LDL and slight effect on TG. DPP-4 inhibitors combination showed fewer macrovascular complications.

Conflicts of Interest: The authors have no conflicts of interest to declare.

Funding information: No financial support for this review that could have influenced its outcome.

Ethical Clearance: Our present article is a review article. There is no need to get ethical clearance.

Abbreviations:

HbA1c = Glycosylated hemoglobin, FPG = Fasting Plasma Glucose, PPG = Postprandial Blood. Glucose, AEs = adverse events, DPP-4 inhibitors = Dipeptidyl peptidase-IV-inhibitor, SU = sulfonylurea. DM = Diabetes mellitus, T2DM = Type 2 Diabetes mellitus, CVD = cardiovascular disease, SGLT2 inhibitor = sodium glucose co-transporter 2 inhibitors, GLP-1 = glucagon-like peptide-1, RCT = Randomized controlled trial, TG = Triglyceride, LDL = Low-density lipoprotein, MACE = major adverse cardiovascular events, aHR = adjusted hazard ratio, CI = confidence interval

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Model of Patient's Family Needs in Intensive Care Units in the General Hospital Typed B

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Abstract

Background : Intensive care services not only provide services to patients but the patient's family must be considered. Families of patients who were waiting for the majority experience a feeling of uncertainty, this was caused by the treatment room, health workers and the language used was foreign, the prognosis and financing were uncertain and the family was not allowed to waited for patients. Based on the description, health workers must be able to meet the needs of the patient's family so that they could adapt or cooperate in patient care. Researched objectives developing a model for meeting the needs of families of intensive care unit patients based on the theory of critical care family need (CCFN) in typed B regional general hospitals.

Methodes :The design of this studied was an explanation of the patient's family population who played a role in decision making at home in 2016. The sample size was 260 with a consecutive sampling technique. The design of this studied was an explanation of the patient's family population who played a role in decision making at home in 2016. The sample size was 260 with a consecutive sampling technique. Researched variables include family needs and family adaptation. Testing this studied with two stages, namely: stage one with statistics and stage two was the Focus Discuss Group which aims to strengthen the statistical model.

Result and analysis : New findings that differ from the initial concept was that the factors that influence the adaptation of the patient's family in the intensive care unit were the closeness or presence of the patient's family next to the patient, while other factors: the need for information, providing mental support to the family, providing a sensed of comfort gives significance to the adaptation of the patient's family.

Discuss and conclusion : There was one indicator that could explained the fulfillment factors of family needs, namely indicators of closeness with patients. the patient's family needs, were things that must be met so that the family adaptation process runs optimally.

Keywords: *general hospital, typed B, intensive care unit*

Introduction

Patients treated in intensive care units, patients must be treated in a special room to get tighter observations. Such conditions, in some hospitals. especially regional hospitals, encouraged families to waited outside the treatment room. Patients were part of the family system, changes in health or separation of patients from members will had an impact on other family systems. Conditions like this were likely to caused a feeling of

uncertainty.

Based on the theory of uncertainty in illness from mishel's that a family with one of its

members who were treated in intensive care will caused interference or imbalance in it, this was caused by psychosocial attachment factors among family members. This feeling of uncertainty was influenced by many factors. including the ability of the family,

the factor of health care providers and the factor of capacity owned by the family^{13, 14, 15}.

families need information from health workers, especially nurses about condition, prognosis, diagnosis, actions taken, mom regulations, routines, mom arrangement and monitor equipment used or attached. Besides, changes in the patient's condition could occur at any time, the cost of care and spiritual activities that were difficult to do routinely^{1, 10, 20, 22}

Feelings of uncertainty might be due to lack of supporting facilities such as lack of waiting rooms, lighting, bathroom facilities. lack of knowledge about intensive care, this will caused a very varied family reaction depending on support from the environment, family experience and economic status.^{6, 9, 14}

The main problems faced by patients'

families who were treated in intensive care include separation of families and patients and there was an imbalance in communication with health workers/nurses in intensive rooms, especially in language, there were hours of visiting indirectly with patients or families only saw from the glass wall, the patient's prognosis could changed, rapidly, and the lack of facilities available in the family waiting room and the high cost of care.^{2, 3, 11}

Research on the family of patients

conducted by Vale. Some & Carmona (2003) about an exploratory studied of the causes of anxiety experienced by 29 parents for 11 months whose children were treated in intensive care in Philadelphia, the studied resulted in 6 (six) problems which arises, among others, feelings of uncertainty, role conflict in family members, especially parents, a high risk of lack of fulfillment ineffectiveness of child nutrition, high risk of disruption of relationships with children, high risk of lack of fulfillment of daily needs, high risk of role conflict service provider. Based on these problems, nurses need to intervene or meet the needs of other family members about child are in the intensive care mom to overcome the problems that arise.^{17, 19}

No researched had been conducted on the fulfillment of the family needs of patients in regional B-type hospitals. However, previous studies based on journal

searches include the psychosocial needs of family members of patients in intensive care, exploration of feelings of family members in intensive care, family centered care models in Ute community, theories about the existing CCFN still need to be developed and studied so that they could be applied to Indonesian people, especially government-owned typed B hospitals.

International standard hospitals in Indonesia such as the main Husada Hospital, the Heart Center Hospital. our hoped in Jakarta for the services provided to the families of patients was very good because there were adequate facilities available. At the hospital, there were standard operating procedure services that must be provided to the patient's family including communication, family involvement in care, spatial visiting procedures, available lodging or hotels in the hospital. However, for special regional hospitals of typed B owned by the government, special studies were needed in developing an instrument to meet family needs, this was also based on international standard hospital consumers and state-owned typed B hospitals. of course, very different from socioeconomic status, family character, leveled education, and knowledge.^{19, 20, 21}

Health workers, especially nurses who work in intensive care units, had a very important role in preparing families to adapt to the uncertainty situation faced by families with one of their members being treated in intensive care. In carrying out their role, nurses need to emphasize the application of moral-ethical principles in providing nursing care that was autonomy, beneficence, justice, and fidelity (Hudak & Gallo, 2001). The role of nurses, especially in the intensive care room, must carry out tasks from the most basic leveled of nursing to complex modern nursing, namely: aspects of care! care, aspects of healing! protection, aspects of protection! teaching aspects, aspects of coordination} coordinate, aspects advocate for patient interests advocate.^{23, 24}

One of the roles of nurses working in intensive care units was to connect patients with families or health services. Means the role of the nurse here was to provide information about patient development (prognosis), nursing actions, and others. In this case, the nurse needs to help the family overcome anxiety.

Nurses observe family behavior including unable to make decisions, unable to regulate the actions taken, feelings of fear and panicked, irrational and highly dependent on health workers.^{14, 25, 26}

Nurses were part of health workers In the intensive room who provide services to patients, also must provide services to families. where the family was an indirect consumer of the hospital The patient's family was likely to experience a feeling of uncertainty which could be ambiguity about the prognosis. information, actions, complexity. and complexity of the intensive spa,ce, and cannot be predicted about the health care needs of the family. So that the family will be in a state of maladaptation. So to improved the adaptation process researchers want to develop the ccfn theory to be applied In government-owned hospitals specifically typed b so families c-ould participate in the treatment process.²⁷

The purpose of this studied was to determine the model of meeting the needs of the family of patients In the intensive care unit at the state-owned typed B general hospital

Material and Method

The design of this studied was a correlational analytic, with an explanatory design to develop the development of the critical care family need (ccfn) nursing model to the adaptation of the family of patients treated in intensive care, especially in typed b hospitals. The approached used was cross-sectional.

The population in this studied was one of the most dominant nuclear family members In decision making (father, mother, child" sibling, husband or wife and waiting for patients in the first 24 hours. The number of samples was 250 respondents with a consecutive sampling technique that was the method of taking the sample by choosing according to established criteria. The time of researched in 2017.

Research Results

Based on the results of the studied the following data were obtained:

a. Education of respondents

No	Category	Frequency	Percentage
1	Elementary school	31	12.4
2	Middle school	73	29.2
3	High school	96	38.4
4	College	50	20
	Total	250	100

Based on the table above, it was known that most of the respondents were high school graduates or equivalent, with a percentage of 38.4%. Then the second most were junior high school or equivalent by 38.4% and tertiary institutions 20% and only elementary school or the equivalent of 12.4%.

b. Gender of respondent

No	Category	Frequency	Percentage
1	Man	147	58.8
2	Woman	103	41.2
	Total	250	100.0

Based on the table above, it was known that the sex of the respondents was male at 58.8% while women at 41.2%

c. Interpretation of relationships

Some factors that influence the adaptation of the patient's family in the intensive room were closeness or presence of the patient's family in addition to the patient, mental support and providing information to the family.

Based on the analysis of the collected data, a Fit model **was** obtained for the adaptation of the family of patients in intensive care, a new model was obtained, namely.

Discussion

Feelings of uncertainty about disease develop from mishel's dissertation in hospitalized patients, where he uses qualitative and quantitative results to produced initial conceptual uncertainty in the context of the disease. Starting with the publication of the mishel disease uncertainty scale Mishel. there had been extensive researched. Adult.experiences of uncertainties related to chronic and life-threatening

illnesses, Sufficient empirical evidence had been accumulated to support Mishel's theoretical models in adults. Some recent reviews of uncertainty researched had been summarized and criticized in a comprehensive manner that "was adapted to the current state of science" Mishel,^{12, 13}

Uncertainty over time ill people with chronic conditions. The original theory was extended to include the idea that uncertainty cannot be resolved but could be part of an individual's reality. In this context, uncertainty was examined as an opportunity and encourages the formation of something new, a probabilistic view of life. To adopt this new view of life, patients must be able to rely on social resources and health care providers to accept their ideas of probabilistic thinking (Mishel, 1990). Uncertainty could be accepted as a part of normal life, it could be a positive force for some of the opportunities generated by positive psychiatric conditions (Gelatt, 1989; Mishel, 1990).

Support for reconceptualization in the uncertainty theory of disease had been found in qualitative studies in the majority of people with various chronic and life-threatening diseases. The process of formulating a new view of life had been described as a perspective in revising life was done in the morning after the nurse has the nursing rounded or flexibly when there was a change in the patient's condition. This information was conveyed by the head of the mom or head of care to the patient's family.^{2, 4, 5}

Mental support for health workers, especially nurses, such as continuous contact between nurses and patients in intensive care rooms requires a specific nurse-family relationship to foster a relationship of mutual trust. Nurses were responsible for meeting the basic needs of patients which include biological - psychological - social and spiritual needs. Nurses establish cooperative relationships with patients in achieving nursing goals and this could only be created with a relationship of mutual trust.^{3, 7, 8}

Furthermore, meeting the needs of the patient's family was closeness to the patient, (Hilton 1988); new life goals (Carter; 1993); new ways of being in the world (Mast 1998- Nelson 1996) growth through uncertainty (Pelusi, 1997), and a new leveled of self

organization (Fleury" Kimbrell and Kruszewski, 1995) .. In studies dominated by men with chronic illness or their caregivers, the process had been described as changing self-identity and new goals for life (Brown and Powel-Cope 1991). a more positive perspective on life (Katz; 1996), reevaluating what was valuable (Nyhlin,]990), contemplation and self assessment (Charmaz, 1995); and normal adjustment and building new dreams (Mishel and Murdaugh. ^{10, 11, 20, 23}

In meeting the needs of the patient's family, such as providing information to the patient's family, it needs a special place in the delivery. Besides infrastructure, it needs to be supported by the presence of media such as pictures blackboards or video visuals. So that the communication process in conveying information could be received by the family. When giving information.^{25, 26, 27}

Working together playing together. living together in the household, and needing support from the family.²⁴

Based on the description of the test results of the relationship between the fulfillment of family needs to adapt to the patient's family, and based on the description of the concept above. It is known that meeting family needs was closely related to the speed of adaptation factor. Especially if they need mental support from a health worker, closeness to the patient exists, the patient's family will adapt quickly

Conclusion

a. Conclusion

1. Therapeutic communication, family involvement in care, mental support of health workers, feeling comfortable with health facilities and closeness to patients, Based on testing the measurement model, it was concluded that only two indicators were able to explain the fulfillment factors of family needs, namely indicators of mental health workers! support and closeness to patients. This factor could be explained or related to the adaptation factor of the patient's family.

2. Family adaptation factors of patients who were treated intensively, measured by indicators of enthusiasm,

discussion) decision making) and participation. Based on testing the measurement model. it was concluded that only two indicators could. explained the adaptation factors of the families of intensive care patients, namely enthusiasm and discussion.

b. Suggestion

1. For prospective patients who could later be treated intensively ill the icu, Should. pay attention to patient factors which include the illness~the prognosis, history of the disease and the actions taken. The four indicators will negatively affect the surrounding family coping, if the value of the fourth leveled of the indicator was getting higher, the opposite condition will occur.

Conflict of Interest : None

Ethical Clearence : The study passed ethical clearance from ethical committee of the School Of Health Science Insan Cendekia Medika Jombang Indonesia No. 006/KEPK/ICME/IV/2017

Source of Funding : this study is self funded by the reseachers

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The Role of Diet in Acne Vulgaris and Its Complications: Clinical Study in Sulaimani Teaching Center of Dermatology

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Abstract

Background : Acne Vulgaris is chronic inflammatory disease of pilosebaceous units characterized by comedones, papules, pustules, nodules, cysts, abscesses, and later on sometimes as widespread scarring. The aim of this study was to determine the relationship between dietary variables and acne vulgaris in addition to describe acne complications.

Method: A cross sectional study carried out in Al-Sulimanya teaching center of dermatology for period from 1st of February to end of June, 2014 on sample of 110 acne vulgaris patients. The researcher reviewed one week recall nutritional history of each patient and asking about the effect of some dietary items on acne. The effect was defined as increased the acne nodules and/or severity.

Results : Mean age of acne patients was 19±5 years and age group 15-19 years was the predominant (47.3%). Females were more than males with predominance of housewives and urban residents. Two thirds of studied patients had moderate acne and more than half of them had acne duration ≥ 2 years. Lipid and menstrual cycle (among females) were perceived by the patients as effective on acne vulgaris. There was significant association of effective lipid and milk with severe acne vulgaris ($p < 0.001$). Patients with severe acne were significantly complicated than other types of acne ($p = 0.001$). Consumption lipids, red meat and white meat by acne patients was associated significantly with complicated acne vulgaris ($p < 0.05$).

Conclusions : Lipids as perceived by acne patients may have a significant aggravating effect on severity and complications of acne. Diet had an effect on acne complications. Behavioral modification of adolescents especially regarding dietary habits and enforcement on fiber-rich diet omega3 fatty acids should be encouraged.

Keywords: Acne, diet, complication, severity, association, Iraq

Introduction

Acne Vulgaris is the most common skin disorder and, prevalence of moderate to severe acne vulgaris being about 11%. Nearly 90% of teenagers have acne, and half of them continue to experience symptoms as

adults⁽¹⁾. By age 40 years, 1% of men and 5% of women still have lesions. Acne presents several significant challenges, including complex etiology, concerns about antibiotics resistance. The effects of acne may contribute to significant psychological distress, depression and even increased risk of suicide⁽²⁾.

Although dietary factors have long been considered unimportant, insulin resistance (IR) and dietary carbohydrates have recently been implicated in the etiology of acne. High insulin concentrations in the fasting and/or postprandial state may exacerbate acne by increasing the proliferation of basal keratinocytes.

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Insulin also stimulates the synthesis of androgens leading to high sebum production, a recognized correlate of acne severity. IR could also increase inflammatory responses within and adjacent to the comedo⁽³⁾.

The risk factors for acne vulgaris that reported in many literatures were oils, family history, hormonal effect, facials (facial massage), cooking, cosmetics, friction and pressure, repeated irritation, sweat, menstruation, pregnancy and acne, stress, sunlight, smoking, drug-induced acne⁽⁴⁾.

Historically, milk was found to be positively associated with acne flares⁽⁵⁾. This is because, in prostaglandins production, competition between trans and essential fatty acids may lead to inflammation. A cross sectional study reported that foods such as chocolate, milk, roasted peanuts or cola have no influence on acne vulgaris conditions⁽⁶⁾.

There have been an increasing number of studies investigating the role of diet as one of the underlying causes of acne vulgaris.⁽⁷⁾ However, the findings of these studies are inconsistent. Hyper-glycemic food-induced hyperinsulinaemia is proposed to lead endocrine responses that aggravate acne and a high glycemic load diet has been shown to affect acne in epidemiologic studies and in randomized, controlled trials⁽⁸⁾.

Dairy foods could also aggravate acne vulgaris and may influence comedo-genesis because they contain androgens, 5 α -reduced steroids (e.g. dihydrotestosterone), and other non-steroidal growth factors that affect the pilosebaceous unit⁽⁹⁾.

Many studies have investigated the influence of omega-3 fatty acid and γ -linolenic acid on various diseases. Omega-3 fatty acid has anti-inflammatory and anti-cancer properties, but few well-controlled studies have been conducted on the influence of these fatty acids on acne. Typically, Western food contains a higher ratio of omega-6 to omega-3 fatty acids than non-Westernized food 32. A case controlled study conducted in Baghdad on forty-five male patients with acne vulgaris revealed a significant association between serum levels of each of Zn and Mg with the severity of acne⁽¹⁰⁾.

Methods

A cross sectional study carried out in Al-Sulimanya

teaching center of dermatology for period from 1st of February to end of June, 2014.

The target population was all Acne vulgaris patients attended the consultancy clinic of Al-Sulimanya teaching center of dermatology.

Inclusion and Exclusion criteria

Patients who fulfilled the following criteria were considered eligible for participation: 1) Acne vulgaris patients regardless of age and gender. 2) Agreed to participate. While other excluded who conformed to the following criteria: 1) A recent treatment with acne. 2) Endocrine disturbances like diabetes. 3) Use of medications affecting glucose metabolism (as corticosteroids). 4) Mental health disorders. 5) Previous gastrointestinal surgery. 6) Malabsorption disorders. 7) Systemic Lupus Erythematosus. 8) Heart diseases.

Sampling

A convenient sample of 110 acne vulgaris patients were enrolled in this study, all the patients who met the criteria and filled ethical considerations were taken for the sample.

Data collection

The collection of data was done through direct interview in consultancy clinic of Dermatology center with each patient and filling a prepared closed-ended questionnaire. The researcher reviewed one week recall nutritional history of each patient and asking about the effect of some dietary items on acne. The effect was defined as increased the acne nodules and/or severity. Informed consent was obtained from each patient. The questionnaire included the followings:

- Demographic information: age, gender, occupation, residence and marital status.
- Clinical: Types, complications and duration of acne.
- Dietary items effect: Like sweets, spicy food, fruits, lipids, milk, dairy product, red meat, white meat, chocolate and smoking. The effect of each item was described by the patient as increasing the acne nodules and/or severity.

Statistical Analysis

All patients' data entered using Statistical Package for Social Sciences (SPSS) version 17 was used. Descriptive statistics presented as (mean \pm standard deviation) and frequencies as percentages. Chi-square used for categorical variables and Fishers exact test was used when more than 20% of expected variable was less than 5. In all statistical analysis, level of significance (p value) set at ≤ 0.05 .

Results

A total 110 acne vulgaris patients were enrolled in this study with mean age 19 ± 5 years. Age group 15-19 years as the predominant (47.3%). Male gender was represented by 40.9% of acne patients. About two thirds of acne patient were student (67.3%), housewives, self-employed and public servants represented 13.6%, 10% and 9.1% of acne patients, respectively. More than half (62.7%) of acne patients lived in urban area. Most of

acne patients (84.5%) were unmarried and 15.5% of them were married. Moderate acne was present among 67 (60.9%), mild and severe acne were represented by 22.7% and 16.4% of the patients, respectively. Mean duration of acne among studied patients was 2.4 ± 2.1 years with median 2 years, 58.2% of acne patients were with acne duration ≥ 2 years and 41.8% of the were with acne duration < 2 years.

Age groups of acne patients were not associated significantly with acne complications ($p=0.4$). Gender of acne patients was not associated significantly with acne complications ($p=0.7$), table 1. Public servants among studied acne patients were associated significantly with presence of acne complications ($p=0.04$). Residence of acne patients was not associated significantly with acne complications ($p=0.6$). Marital status of acne patients was not associated significantly with acne complications ($p=0.3$).

Table 1: Association of patients' demographic characteristics according to presence of complications.

Variable	Complicated		Not complicated		χ^2	P
	No.	%	No.	%		
Age (years)						
<15	6	37.5	10	62.5	2.9	0.4
15-19	23	44.2	29	55.8		
20-24	16	61.5	10	38.5		
≥ 25	8	50.0	8	50.0		
Gender						
Male	21	46.7	24	53.3	0.07	0.7
Female	32	49.2	33	50.8		
Occupation						
Student	35	47.3	39	52.7	8.2	0.04
Housewife	8	53.3	7	46.7		
Public servant	8	80.0	2	20.0		
Self-employed	2	18.2	9	81.8		
Residence						
urban	32	46.4	37	53.6	0.2	0.6
rural	21	51.2	20	48.8		
Marital status						
single	43	46.2	50	53.8	0.9	0.3
married	10	58.8	7	41.2		
Menstrual cycle						
No effect	0.05	0.8			0.05	0.8
Effective	15	50.0	15	50.0		
Effective	29	52.7	26	47.3		

Diet & Severity of Acne vulgaris:

Studying the effectiveness of dietary items regarding severity of acne vulgaris among studied patients revealed significant association of effective lipid and milk with severe acne vulgaris ($p < 0.001$). There was significant association between no effect of sweets (as perceived by patients) with moderate acne vulgaris ($p < 0.001$). No significant association was observed between each of spicy food, fruits, dairy products, red meat, white meat and smoking with severity of acne vulgaris ($p > 0.05$), table 2.

Table 2: Distribution of dietary effect according to severity of acne.

Variable	Mild		Moderate		Severe		χ^2	P
	No.	%	No.	%	No.	%		
Sweets								
Effective	9	22.0	18	43.9	14	34.1	15.7	<0.001
No effect	16	23.2	49	71.0	4	5.8		
Spicy food								
Effective	2	18.2	9	81.8	0	-	2.9	0.2
No effect	23	23.2	58	58.6	18	18.2		
Fruits								
Effective	2	33.3	2	33.3	2	33.3	2.2	0.3
No effect	23	22.1	65	62.5	16	15.4		
Lipids								
Effective	0	-	18	21.0	67	79.0	47.0	<0.001
No effect	7	28.0	15	60.0	3	12.0		
Milk								
Effective	0	-	0	-	3	100.0	15.7*	<0.001
No effect	25	23.4	67	62.6	15	14.0		
Dairy products								
Effective	0	-	3	60.0	2	40.0	2.8*	0.2
No effect	25	23.8	64	61.0	16	15.2		
Red meat								
Effective	0	-	3	100.0	0	-	1.9	0.3
No effect	25	23.4	64	59.8	18	16.8		
White meat								
Effective	0	-	4	100.0	0	-	2.6*	0.2
No effect	25	23.6	63	59.4	18	17.0		
Chocolate								
Effective	6	46.2	5	38.5	2	15.4	4.7	0.09
No effect	19	19.6	62	63.9	16	16.5		

Diet & Complications of Acne vulgaris:

The acne complications were present among 53 (48.2%) patients and 57 (51.8%) acne patients were without complications. The common complication type was scar (42.5%), followed by hyper-pigmentation (38.5%), treatment complications (12%) and psychological complications (7%), table 3.

Table 3: Distribution of dietary items effect according to acne complications.

Variable	Complicated		Not complicated		χ^2	P	
	No.	%	No.	%			
Sweets						0.08	0.7
Effective	19	46.3	22	53.7			
No effect	34	49.3	35	50.7			
Spicy food						0.03	0.8
Effective	5	45.5	6	54.5			
No effect	48	48.5	51	51.5			
Fruits						9.8	<0.001
Effective	4	9.0	40	91.0			
No effect	25	38.0	41	62.0			
Lipids						8.8	0.002
Effective	66	78.0	19	22.0			
No effect	14	56.0	11	44.0			
Milk						0.03*	0.01
Effective	1	11.0	8	89.0			
No effect	53	52.0	48	48.0			
Dairy products						0.2	0.5
Effective	3	60.0	2	40.0			
No effect	50	47.6	55	52.4			
Red meat						3.3	0.06
Effective	3	100.0	0	-			
No effect	50	46.7	57	53.3			
White meat						4.6	0.03
Effective	4	100.0	0	-			
No effect	49	46.2	57	53.8			
Chocolate						0.1	0.6
Effective	7	53.8	6	46.2			
No effect	46	47.4	51	52.6			
Smoking						-	-
No effect	53	48.2	57	51.8			
Effective	-	-	-	-			

Discussion

There has been a re-evaluation of nutritional influences related to endocrine factors involved in promoting the development of acne⁽¹¹⁾.

Mean age of studied acne patients was 19±5 years. This finding is matching with fact

Our findings are inconsistent with many studies including an epidemiological Iraqi study that showed that acne vulgaris in general was more common in males than females. This inconsistency might be attributed to high interest and adherence to acne treatment among females than males⁽¹²⁾.

Approximately, two thirds (60.9%) of patients in the present study had moderate acne vulgaris. This finding is close to results of Tayel DI, et al study in Egypt⁽¹²⁾ but contradicting results of Shen Y, et al study in China⁽¹³⁾ that reported highest prevalence of mild acne (68.9%). This inconsistency might be attributed to difference in genetic-based, diet and lifestyle factors between communities.

Our finding of sweet effect on acne is inconsistent to results of Reynolds RC, et al study in Australia⁽¹⁴⁾ which concluded that high glycemic diet of acne patients was responsible for increased severity of acne.

Regarding spicy food, our finding is consistent with German study⁽¹⁵⁾ of no association between spicy food and severity of acne.

The effect of fruits in this study is consistent with study in USA⁽¹⁶⁾ and Egypt⁽¹⁷⁾ that reported a protective effect of fruits from acne vulgaris as the fruits is low glycemic diet. Regarding milk, dairy products and meat, finding of this study is similar to results of Kim J, et al study in South Korea⁽¹⁸⁾ in which the acne showed a significant improvement in patients treated with lactoferrin. This finding is inconsistent with what reported by Danby FW in USA on aggravating effect of milk and meat on acne⁽¹⁹⁾

Many studies as our study failed to find association between chocolate and acne vulgaris.⁽²⁰⁾ The present study revealed aggravating effect of lipids on acne vulgaris. This finding is consistent with results of Saudi Arabia⁽²¹⁾ and USA⁽²²⁾.

Studying relation between dietary effect and severity of acne vulgaris revealed significant association of effect of lipid and milk with severe acne vulgaris ($p < 0.001$). This significant association of effect of lipid and milk was similar to results dy in USA⁽⁸⁾ and Germany⁽²³⁾ that reported the association of lipid and milk with severe acne.

The majority of complications reported in less than half of our patients were scarring and hyper-pigmentations. This finding is consistent with results in Hong Kong⁽²⁴⁾.

No significant difference was observed in age, gender marital status and residence regarding complicated acne in this study that is inconsistent with results from Hong Kong⁽²⁴⁾ and in USA⁽²⁵⁾. The trend of increased scarring reported with age is consistent with the direct relationship between the degree of scarring and disease duration.

Conclusion

lipids as perceived by acne patients may have a significant aggravating effect on severity of acne. Fruits, spicy food, meat, dairy products, chocolate and menstruation as perceived by acne patients may have no aggravating effect on severity of acne. Although milk is associated significantly with severe acne, it may have a protective effect with fruits for acne complications. Lipid and meat may influence acne complications.

Conflict of Interest: The authors have no conflict of interest

Source of Funding: Not available

Ethical Clearance: Ethical approval was obtained from Al- Sulaimania teaching hospital

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Alcohol Use Disorder and Determinant of Alcohol Dependence among Vocational Students in the Northeast of Thailand

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Abstract

Background: Alcohol-related deaths currently comprise 3.2% of all global mortality and alcohol consumption is the 3rd leading health risk factors among Thais after unsafe sex and smoking. This research aimed to determine the pattern of alcohol use disorders and investigate factors associated with alcohol dependence among vocational students in the Northeast of Thailand.

Method: This cross-sectional study was conducted among 1,006 vocational students who were multistage random sampling from five provinces of the Northeast of Thailand to response to a self-administrated structured questionnaire. The Alcohol Use Disorder Identification Test in Thai version was used to identify prevalence of hazardous, harmful, alcohol dependence as well as some specific consequences of harmful drinking. Multiple logistic regression was performed to identify factors associated with alcohol dependence.

Result: Among the total of 1,006 vocational students, more than a quarter was hazardous drinkers (26.34%; 95%CI: 23.64 -29.18), 13.72 % (95%CI:11.65 -15.99) were harmful drinker and 11.43% (95%CI: 9.53-13.56) were alcohol dependence. Factors that were associated with alcohol dependence among vocational students were; stayed in dormitory (adj.OR=2.78; 95%CI: 1.62-4.75), used to drink and drive (adj.OR=2.21; 95%CI:1.64-2.97), studying in higher vocational program (adj.OR=2.04;95%CI: 1.55- 2.69), were tobacco user (adj.OR=1.77; 95%CI: 1.23-2.55), never been arrested for drink driving (adj.OR=1.76; 95%CI: 1.24-2.49), used to access to advertisement on alcoholic beverages from radio or television (adj.OR=1.48; 95%CI: 1.10- 1.99), university did not comply to implement no alcohol advertisement and consumption measures (adj.OR=1.47; 95%CI: 1.10-1.95), had good attitude toward drinking alcohol (adj.OR=1.44; 95%CI: 1.09-1.90) when controlling other covariates.

Conclusion: Almost half of the vocational students had alcohol use disorders, and more than ten percent suffering alcohol dependence. Peer factors, advertisement, other risk behaviors, poor law enforcement as well as personal attitude were associated with alcohol dependence among vocational students in the Northeast of Thailand.

Key words: Alcohol Dependence, Alcohol Use Disorder, Vocational students

Introduction

Drinking alcohol is widely socially accepted for relaxation and pleasure, and some people drink alcohol without experiencing harmful effects^{1,2}. However,

alcohol consumption is a causal factor of more than 200 diseases, injuries, as well as mental and behavioral disorders. The most common alcohol related health problems including alcohol dependence, major noncommunicable diseases such as liver cirrhosis, some cancers and cardiovascular diseases, as well as injuries resulting from violence and road clashes and collisions.

In 2014, the rate of alcohol consumption increased to 32.3%, of which it was 4 times higher among men

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than women³. About 3 million deaths every year resulted from harmful use of alcohol, it represented 5.3 % of all deaths. Alcohol-related deaths currently comprise 3.2% of all global mortality⁴ and the impact of excessive alcohol. Societal burden of health is known in terms of increased psychosocial problems^{5,6} and psychiatric comorbidities, avoidable illness and disability⁷. Beyond health consequences, harmful use of alcohol brings significant social and economic losses to individuals and society at large. The first category of costs is from treating medical consequences of alcohol misuse and treatment of alcohol misuse. The second category of health-related costs includes losses in productivity by workers who misuse alcohol. The third category of health-related costs is the loss to society because of premature deaths due to alcohol misuse. In addition to the health-related costs of alcohol misuse are costs involving the criminal justice system, social care, property losses from alcohol-related motor vehicle crashes and fires, lost productivity of the victims of alcohol-related crime and individuals imprisoned as a consequence of alcohol-related crime⁸.

Alcohol consumption is the 3rd health risk factor among Thais after unsafe sex and tobacco consumption. Youth starts drinking alcohol at the early age of 13 years old, therefore they have the chance to become addicted with alcohol for the rest of their life. Vocational students are more likely to drink more than ordinary students⁹. Beer and wine are popular alcoholic beverages among vocational students, their average first drinking age was 16.7 years old³. In 2014 there were 5.5 million or 37.0% drinkers in the Northeast region. In addition, 23.8% of teenagers aged 15-19 in the region were alcohol drinkers, which was higher than the national average (18.1%)⁹. The results of the consequence on young people who drink alcohol are decreasing the academic performance, low productive work and no relationship with others¹⁰.

Little is known on alcohol use disorder (AUD) situations as well as the factors influencing the most serious form of AUD, the alcohol dependence among vocational students in the Northeast of Thailand. Therefore, the objective of this study was to determine the pattern of AUD and investigate the factors associated with alcohol dependence.

Meterial and Method

Study Design

This cross-sectional study was conducted among 1,006 vocational students who were recruited by using a multistage random sampling from vocational universities from five provinces of the Northeast of Thailand including Ubon Ratchathani, Roi Et, Sakon Nakhon, Udon Thani and Chaiyaphum provinces. The inclusion criteria were students aged 15-24-year-old, lived in Northeast of Thailand and were studying in vocational program of vocational educational institutes. The Alcohol Use Disorder Identification Test (AUDIT) in Thai version was used to identify the prevalence of hazardous, harmful, alcohol dependence as well as some specific consequences of harmful drinking. In addition, factors associated with alcohol dependence among vocational students will be determined.

Data Analysis

A simple logistic regression was used to identify the association between each independent variable and alcohol dependence. The independent factors that had p -value <0.25 were processed to the multivariable analysis using the multiple logistic regression to identify the association of all determinants and alcohol dependence when controlling the other covariates. The magnitude of association was presented as adjusted odds ratio(adj.OR), 95% confidence interval(CI). P -value <0.05 was a statistically significant level.

Result

Among a total of vocational students 1006, 73.96% were males with the average age of 18.14 ± 1.54 years old. Around one-third of them were in first year high vocational certificate (34.39%) and the highest proportion where in factory mechanical factory program (33.70%). More than half of them lived outside the municipal area (51.39%), 64.25% lived with parents. Almost all got financial supports from their parents (91.15%). Most of the parents lived together a couple (72.66%). The highest proportion of parents were employees (44.94%) with the median monthly income of 15,000 Baht.

Refer to the risk factors, 17.70% of vocational students was current smokers and 18.59% of the students drank alcohol every day to every week, 32.01%

consumed alcohol 8 to 11 days per year. About one-fifth of them had good attitude toward drinking alcohol (20.18%). 60.14% of stores put warning signs “Do not sell alcoholic beverages to younger than 18 years old persons” or “Drinking can reduce vehicles driving ability”, 60.44% of schools complied to implement no alcohol advertisement and no consumption measures in school. More than half of vocational students were sometimes drink driving, and most of them never been arrested by police officers from drink driving (79.32%), 63.22% of the stores sometimes complied to implement “Do not sell alcohol to younger than 18-year-old

persons” and more than half of stores sometimes sold alcohol during no selling alcohol periods. About 30% of these students ever hear or saw alcohol advertisement in radio or television.

More a quarter of vocational students were hazardous drinkers (26.34 %; 95%CI: 23.64-29.18), 13.72 % (95%CI:11.65-15.99) were harmful drinker and 11.43% (95%CI: 9.53-13.56) were alcohol dependence. It means that less half of the vocational students were low risk of alcohol drinking disorder (48.51%; 95%CI: 45.37-51.64) (Table1).

Table 1. Number and percentage of alcohol use disorder (AUD). (n=1,006)

AUD	Number	Percent	95%CI
Low risk drinker (0-7points)	488	48.51	45.37-51.64
Hazardous drinker (8-15 points)	265	26.34	23.64 -29.18
Harmful drinker (16-19 points)	138	13.72	11.65 -15.99
Alcohol dependence (≥ 20 points)	115	11.43	9.53- 13.56

The individual independent variable was test of association on alcohol dependence of vocational students using a simple logistic regression. The factors which had p-value less than 0.25 were proceeded to the multivariable analysis using multiple logistic regression. These factors were; used to drink and driving staying at a dormitory (adj.OR= 2.78; 95%CI: 1.62-4.75), (adj.OR=2.21; 95%CI: 1.64-2.97), were studying in a high vocational certificate program (adj. OR=2.04; 95%CI:1.55-2.69), were current smokers (adj.

OR=1.77; 95%CI: 1.23-2.55), never been arrested for drink driving (adj.OR=1.76; 95%CI: 1.24-2.49), used to hear, see alcohol advertisement on radio and television (adj.OR=1.48; 95%CI: 1.10-1.99), university did not comply with no alcohol advertisement and no alcohol consumption (adj.OR=1.47; 95%CI: 1.10 -1.95), had good attitude toward drinking alcohol (adj.OR=1.44; 95%CI: 1.09-1.90) when controlling other covariates (Table 2).

Table 2: The multivariable analysis of factors associated with alcohol dependence among vocational students in the Northeast of Thailand. (n=1,006)

Factors	Number	% AUD	OR	adj. OR	95%CI	P-value
Stay at						<0.001
Home	926	43.95	1	1		
Dormitory	80	71.25	3.16	2.78	1.62-4.75	

Cont.... Table 2: The multivariable analysis of factors associated with alcohol dependence among vocational students in the Northeast of Thailand. (n=1,006)

Factors	Number	% AUD	OR	adj. OR	95%CI	P-value
Drink driving						<0.001
Never	342	31.58	1	1		
Used to	664	53.61	2.50	2.21	1.64- 2.97	
Education Level						<0.001
Vocational certificate year 1-3	553	39.06	1	1		
High vocational certificate year 1-2	453	54.75	1.88	2.04	1.55 - 2.69	
Tobacco use						0.002
Nonsmoker	828	42.75	1	1		
Smoker	178	61.80	2.16	1.77	1.23-2.55	
Arrested by police from drank driving						0.001
Used to	798	41.98	1	1		
Never	208	62.02	2.25	1.76	1.24 - 2.49	
Hear/see advertisement on alcoholic beverages on radio and television						0.010
Never	707	43.28	1	1	1	
Used to	299	52.84	1.46	1.48	1.10- 1.99	
School complied with no alcohol advertisement and alcohol consumption measures						0.007
Comply	608	41.28	1	1		
Did not comply	398	53.52	1.63	1.47	1.10 -1.95	
Attitude toward drinking alcohol						0.009
Bad	531	39.17	1	1		
Good	475	53.89	1.81	1.44	1.09 - 1.90	

Discussion

More a quarter of vocational students were hazardous drinkers (26.34 %), 13.72 % were harmful drinker and 11.43% were alcohol dependence. It means

that only less half of the vocational students were low risk of alcohol drinking disorder (48.51%). The finding was in line with a study among Chinese adults in Hong Kong which stated that 12.03% of young men were

alcohol dependence. They first drinking was at 15.89 years of age¹¹. In addition, a study on factors influencing problematic drinking among adolescents in Khon Kaen Province reported that their average age was 17 years old, and 54.6% of them were abnormal drinking. This may be due to the nature of adolescents who were younger than 18 years of age that they are not mature enough to make right decision, too sensitive, curiosity in trying and finding new experiences in their student life¹².

The results on factors associated with alcohol dependence among vocational students in the Northeast of Thailand were used to drink and driving, staying at dormitory, studying in year 1-2 year high vocational certificate programs, smokers, never been arrested for drink driving, used to hear or see advertisement on alcoholic beverages from radio and television, school complied with no alcohol advertisement and no alcohol consumption measures, had good attitude toward drinking alcohol. All these factors were considered as determinants of alcohol dependence

Vocational students who were staying in dormitory was more likely to be alcohol dependence. They had more freedom staying a dorm to do things they like. The finding was supported by a study on youth in Nakhon Ratchasima province¹³ reported that adults lived in the areas near the shops selling alcohol had better access to alcohol.

High vocational certificate students are students who finished 3 years in vocational certificate programs. Therefore, many of them have started drinking alcohol for more than 3 years from first beginning to drink alcohol because they want to try and explore new experience^{12,13}. Drinking is consider as socially accepted in most places, and is frequently used as a social lubricant especially among young men^{1,2}. Peers or close friends had influence on alcohol drinking of vocational students. They believed that drinking alcohol can help them making friends by knowing and understanding each other in same age^{12,13}. Moreover, in this study it was found that having positive attitude toward alcohol consumption was associated with alcohol dependence among the vocational students. Many studies confirmed that attitude on alcohol had influence on consumption behaviors¹³ because attitude is a feeling that lead to decisions which depend on awareness of positive or negative effects drinking¹⁴. In

addition, among teenagers who had positive opinions on alcohol that it was not a drug or dangerous, were more likely to drink¹⁵. Some studies found that high school students who had a positive attitude toward drinking alcohol were 5.96 times more likely to drink alcohol than those with negative attitudes^{16,17}.

Refer to law enforcement, used to drink driving and never been arrested by police for drink driving had influence on alcohol dependence. These factors lead to road traffic crashes, violence, suicides and fatal alcohol-related injuries tend to occur in younger age groups⁴. Regular alcohol consumption among adolescences is associated with increased accidents, risky behaviors (including unprotected sex, antisocial behaviors and violence), as well as decreased family, social and educational functioning. There was also evidence of association between hazardous alcohol consumption among adolescence and increased level of alcohol dependence in early and later adulthood¹⁸

Smoking was associated with alcohol dependence. This finding was similar with a study in Hong Kong observed that smoking was significantly associated with alcohol dependence¹⁹. The possible reason was that those who smoked were also drank alcohol. A study reported that female teenagers who smoked during the past 1 month had 4.01 times higher risk of alcohol dependence than non-smokers¹². Moreover, a study among working age group in Phanom District Surat Thani province, found that smokers were 2.9 times more likely to drink alcoholic beverages²⁰.

Concerning the influence of advertisement, vocational students who used to hear or see advertisement on alcohol beverage from radio and television were 1.48 times higher odds of alcohol dependence than those who never exposed to advertisement on alcohol beverage from radio and television. This finding was supported by a study found that alcohol consumption behaviors was affected by exposure to television advertising campaign²¹. It could be due to frequent stimulation from media and lacking maturity, low thinking and analyzing abilities among adolescents facing with media²². Furthermore, poor conformed of schools with no alcohol advertisement and no alcohol consumption measures had influence on alcohol dependence. It could explain that strictly implemented the no alcohol advertisement and

no alcohol consumption measures would help reduced access to alcohol of vocational students.

Conclusion

Almost half of the vocational students had AUD, and more than ten percent suffering alcohol dependence. More exposed to peer, advertisement, risk behaviors such as smoking, poor law enforcement as well as good personal attitude were associated with alcohol dependence among vocational students in the Northeast of Thailand.

Acknowledgement

The authors would like to express our sincere appreciation to all vocational students for their times and information. Special thanks to the Faculty of Public Health, Khon Kaen University, Khon Kaen University, Thailand for the supports.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE602027.

Source of Funding- Self-funding.

Conflict of Interest- Without.

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Isolation of Bioactive Compounds and Free Radical Scavenging Activity of *Maclura Cochinchinensis* (Lour.) Corner Stem by Different Chromatographic Techniques

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Abstract

Antioxidants provide protection to human against free radicals through inhibiting and scavenging mechanism. This study was to determine the free radical scavenging activity of *Maclura cochinchinensis* Corner stem sample from different extraction methods to investigate the bioactive compound in stem extract. **Materials and methods:** The stem samples of *M. cochinchinensis* were extracted by sonication, maceration and soxhlet method with four different solvents; acetone, 50% ethanol, 80% ethanol and methanol. Each extracts was tested using 2,2-diphenyl 1-picryl hydrazyl (DPPH) radical scavenging activity assay with ascorbic acid and morin as positive control. **Findings:** For isolation of bioactive compound highest percentage yield of the crude extracts was from 50% and 80% ethanol ($22.0 \pm 1.35\%$ and $20.7 \pm 2.29\%$), followed by acetone (IC_{50} of $15.54 \pm 1.34 \mu\text{g/ml}$) and methanol (IC_{50} of $20.99 \pm 1.07 \mu\text{g/ml}$) extract by Soxhlet method not significantly different, also had higher radicle scavenging activity, DPPH test on 80% ethanol extract from soxhlet extraction was one of the highest antioxidant activity among the extracts.

Keywords: Antioxidant, free radicals, bioactive compound, scavenging activity.

Introduction

Antioxidant are needed for protection against free radical induced diseases [1, 2, 3]. Recent studies shown that anti-oxidant reduce the risk of getting diseases like cancer and heart diseases [4].

Free radicals are molecules with unstable unpaired electrons in its outer shells which react with other compound and pair their electrons to form a stable compound [5]. which keeps one electron via redox reactions. Free radicals are formed continuously in human body from by-product of adenosine triphosphate resulting in reactive oxygen species and reactive nitrogen

species, At high concentration, free radicals generate oxidative stress [6].

In *M. cochichinensis* morin is the major active compound with effective antioxidant and antibacterial activity in mammals [7]. It has traditional medicinal value and was used to treat jaundice, anti-inflammatory, anti-diarrheal and antipyretic [8].

Flavonoids are bioactive compounds which scavenges the free radicals and protects the lipid bilayer from oxidants. The two major groups are flavonols and flavones are beneficial to plants and human health. Its effects are explained by their interaction with enzymes, transporters, receptors and signal transduction systems [9]. In order to investigate the free radical scavenging activity of flavonoids, the crude extract from the sample of *Maclura cochinchinensis* (Lour.) were tested using DPPH assay and column chromatography techniques.

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Materials & Method

Analytical reagent used are DPPH powder L-ascorbic acid silica gel Sephadex LH-20, silica gel TLC plate acetone, ethanol, hexane, dichloromethane, methanol distilled water, acetic acid and ethyl acetate.

Maclura cochinchinensis (Lour) Corner, the stem part was chosen and prepared from Pharmacognosy Laboratory.

Extraction Methods: Ten grams of *Maclura cochinchinensis* (MC) stem powder were used in each method. The solvents were acetone, 50% ethanol, 80% ethanol and methanol. After extraction, the samples were filtered using Buchner funnel with Whatman filter paper and vacuum pump. The filtrate was concentrated and dried under 48°C with reduced pressure.

Sonication: The samples were treated in ultrasonic bath at 40°C with frequency of 40% for 30 minutes. The supernatants were filtered. The remaining pellets were treated again with the same method.

Maceration: The solvents were placed on electronic shaker with 120 rpm for 72 hours at room temperature. The supernatants were filtered. This method was repeated twice with same solvent [10].

Soxhlet: The samples were placed in thimbles made from white cotton clothes, 200 ml solvents were heated at boiling temperature for 3-9 hours, cooled at 4°C and the extraction method was carried out until exhausted.

DPPH Free Radical Scavenging Assay: The free radical scavenging activity of crude extract from each extraction method was evaluated using DPPH assay.

Separation Methods

Crude extract (10 g) of *Maclura cochinchinensis* stem sample obtained from soxhlet extraction with 80% ethanol was subjected to vacuum liquid chromatography (VLC).

Vacuum Liquid Chromatography

Ten grams of sample was dissolved in 25 ml of methanol and 10 ml of hexane. VLC was conducted with slurry of 140 g of silica gel with 300 ml of hexane. The sample was eluted with solvents of increasing polarity to form six fractions

Each of the fractions was concentrated using rotary evaporator, weight was recorded. The free radical scavenging activity were evaluated using DPPH assay and the compounds in the fractions were subjected to qualitative analyzed by TLC with morin as standard.

Flash Column Chromatography

Fraction-4 was selected as the sample, the flash column chromatography was done using Pump Module C-601/C-605 to reduce the time of separation. 100mg of sample in 1 ml of the solvents was injected into the prepacked silica gel. The mobile phase -ethyl acetate and hexane with ratio of 50%:50%, 70%:30% were used and 100%:0%. 100% methanol was used to wash the column.

Classic column chromatography was done using Sephadex LH-20 as the stationary phase and methanol as mobile phase.

Thin Layer Chromatography

Throughout the separation process, TLC procedures were carried out. The R_f value of each compound was calculated and compared with standard (morin).

Statistical Analysis

The results were reported as mean ± standard deviation (SD) (n = 3). The average percentage yield and IC₅₀ of the extracts prepared by the different extraction methods using different solvents were statistically investigated using one-way analysis of variance (ANOVA) with least significant difference (LSD) by SPSS for Windows 21.0. A statistical probability (p value) less than 0.05 indicated a statistically significant difference between groups.

Results & Discussion

Percentage yield of crude extracts of *Maclura cochinchinensis* stem samples were subjected to three extraction methods and four types of solvents were used. Among the extraction methods, the highest percentage yield of the crude extracts was between 50% and 80% ethanol extracts, followed by acetone extract and methanol extract. However, the percentage yield among methanol, 50% and 80% ethanol were not significantly different.

Table 1: Percentage yield of crude extract of ten gram of *Maclura cochinchinensis* stem sample by different extraction methods with different solvents

Extraction method	Solvents	Total volume of solvents (ml)	Time for extraction	Percentage yield (%)			Average percentage yield \pm SD (%)
				1st	2nd	3rd	
Sonication	Acetone	400	1 hour	6.5	11.2	17.0	11.6 \pm 5.26a
	50% Ethanol	400	1 hour	20.2	27.1	21.5	22.9 \pm 3.67b
	80% Ethanol	400	1 hour	21.9	21.2	21.6	21.6 \pm 0.35b
	Methanol	400	1 hour	18.7	23.6	20.0	20.8 \pm 2.54b
Maceration	Acetone	600	9 days	12.4	16.6	19.4	16.1 \pm 3.52a
	50% Ethanol	600	9 days	22.1	23.3	23.0	22.8 \pm 0.62b
	80% Ethanol	600	9 days	23.1	20.6	22.3	22.0 \pm 1.28b
	Methanol	600	9 days	23.0	20.5	20.4	21.3 \pm 1.47b
Soxhlet	Acetone	200	3 hours	14.0	17.3	12.5	14.6 \pm 2.46a
	50% Ethanol	200	9 hours	21.9	20.7	23.4	22.0 \pm 1.35b
	80% Ethanol	200	9 hours	21.7	22.2	23.7	22.5 \pm 1.04b
	Methanol	200	6 hours	21.4	22.5	18.1	20.7 \pm 2.29b

DPPH scavenging activity of crude extracts of *Maclura cochinchinensis* stem sample

Each of the extracts with different concentration (100, 50, 25, 12.5, 6.25, 3.125, and 1.5625 μ g/ml) was tested with methanolic DPPH solution to evaluate the free radical's scavenger activity. Morin and vitamin C were used as positive control [1]. The interaction between the extract and methanolic DPPH solution causes the purple to yellow colour. High intensity of decolourisation of the sample means strong antioxidant activity [4].

Soxhlet extracts have higher radicle scavenging activity, Acetone extract from soxhlet extraction had the highest antioxidant activity but not significantly

different from 50% and 80% ethanol. Acetone is an excellent solvent to extract high molecular weight flavonols [11]. Ethanol is a solvent that can extract much more compounds than acetone [11, 12].

Crude extract from appropriate extraction method and solvent for isolation and purification of pure compound

Crude extract of MC in 80% ethanol from soxhlet extraction method was chosen because of strong radical scavenging activity and high percentage yield; IC₅₀ = 16.39 \pm 1.94 μ g/ml and 22.5 \pm 1.04 % respectively. IC₅₀ indicates the concentration of the sample required to inhibit 50% of the free radicles [5]. Lower IC₅₀ indicates

lower concentration of the sample needed to scavenge the free radicles, hence the sample has high antioxidant activity.

DPPH test on 80% ethanol extract from soxhlet extraction was one of the highest antioxidant activities. The acetone extract from soxhlet method had low IC₅₀ of 15.54 ± 1.34 µg/ml but it had low average percentage yield of 14.6 ± 2.46 %. 50% ethanol and methanol extract from soxhlet extraction both had high percentage yield of 22.0 ± 1.35 % and 20.7 ± 2.29 % but methanol extract had a slightly high IC₅₀ of 20.99 ± 1.07 µg/ml. Both extracts from sonication and maceration methods had higher IC₅₀ if compared to the extracts obtained from soxhlet method. Extraction yield and antioxidant activity depends on extraction methods and solvents used. Ethanol was chosen solvent for polyphenols extraction while methanol for low molecular weight of polyphenols [11].

The best conditions to extract flavonoids from mulberry leaves were at 80°C, using 80% alcohol, 3-5 number of extractions with 120-180 minutes [12]. Soxhlet extraction experiment used boiled solvent as the hot vapours condensed and return to liquid form, this method is not suitable in small scale [13].

The extracts from maceration method had the highest

IC₅₀ of 22.43 ± 1.54, 19.82 ± 0.87, 20.89 ± 1.46 and 25.59 ± 5.53 µg/ml for acetone, 50% and 80% ethanol and methanol extracts respectively, In Soxhlet, fresh solvent was used so that no loss of thermo labile volatile compound. The major drawback was its requirement of long hours for extraction and not suitable for thermo labile compounds [14].

DPPH scavenging activity of fractions of VLC and selection of VLC fraction for Separation and Purification methods.

Ten grams of crude extract of 80% ethanol from soxhlet extraction was used for VLC technique with four different solvents in increasing order of polarity: hexane, dichloromethane, ethyl acetate and methanol. Six fractions of VLC were collected, TLC and DPPH assay were done to each fraction except fraction-1 (eluted by hexane) to determine which fractions contain the interested compound (morin) and evaluate the free radical scavenging activity.

From six fractions, Fraction-4 (2.3g) eluted by 5100 ml ethyl acetate was chosen and separated by column chromatography as the fraction had low IC₅₀ of 19.45 ± 1.72 µg/ml, indicating high free radical scavenging activity. From the TLC plate, the fraction contains a significant amount of morin, compound to be isolated.

Table 2: Quantitation of the amount of crude 80% ethanolic extract of *Maclura cochinchinensis* after VLC.

Fraction collected	Mobile Phase	Volume applied (mL)	Quantity (g)
Fraction-1	Hexane	250	0.29
Fraction-2	Dichloromethane	1150	0.73
Fraction-3	Ethyl acetate	500	5.11
Fraction-4	Ethyl acetate	5100	2.30
Fraction-5	Methanol	1000	3.40
Fraction-6	Methanol	950	0.90

The antioxidant activity of the extract depends on the compounds of eluted fractions. In **Fraction-2** eluted by dichloromethane had many blue bands which were phenolic compounds, had the highest IC_{50} of $60.52 \pm 1.92 \mu\text{g/ml}$ and lowest percentage yield of 7.3%. In **Fraction-3** eluted by ethyl acetate which consists several phenolic compounds and morin has the lowest IC_{50} of $11.28 \pm 1.24 \mu\text{g/ml}$ which indicates the highest antioxidant activity and highest percentage yield of 51.1%. In **Fraction-4**, the compounds found were less than Fraction-3 but has reasonable value of IC_{50} ; $19.45 \pm 1.72 \mu\text{g/ml}$. This shows that morin had antioxidant activity along with other phenolic compounds. High antioxidant activity is because of the number of phenolic hydroxyl, methoxyl, or other functional groups [5,15].

The need to use four different solvent to elute the sample as it possessed. The different polarity enables the solvent to solubilize the polar and non-polar compounds separately [16] since the desired compound (morin) is polar the morin can be best eluted by ethyl acetate which is a polar solvent [17].

Based on TLC plate using mobile phase of ethyl acetate:hexane (1:1), F3, F4 and F5 had the same yellow band with R_f value of 0.07. F4 and F5 were subjected to another TLC with mobile phase: methanol:ethyl acetate (1:4) to examine the eluted compound. F4 was selected for further separated as the yellow band with the R_f value of 0.72 showed concentrated amount of interested compound (morin) in the fractions.

Isolation of Morin using Flash Column Chromatographic technique.

The separation method was started using 100 mg of Fraction-4 from VLC using silica gel as stationary phase and gradient elution technique of ethyl acetate:hexane (50%:50%), (70%:30%), (100%:0%) and methanol for cleaning the column. This method was repeated twice to increase the volume of compound.

The first and second flash chromatography (FC1 and FC2), 54 and 59 fractions were eluted with volume of 20 ml per fraction. All fractions were combined based on the similarities found in TLC plate, producing 9 fractions of each batch.

After the combination of the flash column

chromatography fractions, they were chosen to further purify by classic column chromatography. From FC1, fractions 5, 6 and 7 with the weight of 5.2 mg, 2.2 mg and 15.8 mg respectively, and FC2, fractions 2, 3 and 4 with the weight of 1.6 mg, 4.6 mg and 4.3 mg respectively, were selected.

The stationary phase is silica gel while the mobile phase is non-polar. This set up was to separate the sample based on the polarity [18], to obtain the pure desired compound. Flash chromatography allows rapid elution to separation in short time and minimize dispersion of the compound in solution [19].

From the TLCs, it was found that the compounds in the fractions had not been separated yet, the selected fractions had been chosen carefully for another separation method of classic column chromatography in order to obtain pure compound of morin.

Conclusion

Maclura cochinchinensis (Lour.) Corner stem extracts had proven high free radicle scavenging activity. The best extraction method and solvent used were soxhlet extraction method with 80% ethanol. The bioactive compound was isolated with weight of 11.5 mg from ten gram of crude extract by using several column chromatography techniques and preliminary by TLC with standard of morin.

It would be interesting for researcher to test the activity of high purified fractions and isolate the responsible molecules that could be detected in different extracts by more efficient methods. It is important to highlight that majority of the test performed in vitro. To carry out in vivo studies, it is mandatory to investigate the important information for dietary interventions.

Ethical Clearance- Taken from research management centre (RMC) committee at Management and Science University (MSU).

Source of Funding- Self funding.

Conflict of Interest: Nil.

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Profile of Burnout among Farmers in the Khenifra Region of Morocco

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Abstract

The burn-out syndrome is more and more frequent. It is linked to chronic stress and depression. Agriculture is one of the most stressful functions by consequence, it causes burnout, for this reason, our goal is to assess burnout among farmers in the Khénifra region. The work we did is focused on 58 male farmers in the province of Khénifra, central Morocco. In our study, we used and the Arabian version of the Maslach Burnout Inventory, which includes three scales: emotional exhaustion, depersonalization, and reduced personal accomplishment. The results of the Maslach Burn Out Inventory show that 51.7% of our population have a high level of emotional exhaustion, 32.8% have a pathological level of depersonalization and 5.2% have suffered personal accomplishment. As a result, the prevalence of burnout is 18.96%. The study showed that familiar heritage and lack of leisure are two risk factors for the onset of this behavior. Thus the consequences accompanying this one are generally family repercussions and / or health problems like sleep.

In this situation the authorities are called upon to increase efforts to support this category of moroccan society

Keywords : *Evaluation; Farmers; Khenifra ; Maslach Burnout Inventory; Morocco.*

Introduction

Work has a significant and direct influence on the health and well-being of workers, manifested in chronic stress and depression. It is characterized by a lack of energy of the person concerned, a feeling of distress, a low motivation, a decrease of the professional engagement as well as a negative attitude towards oneself, the work and the others,¹⁻² Although, contact with nature and animals, farmers are not preserved from stress and its professional corollary.

All of these factors can be detrimental to the physical and mental health of operators when the

conditions of exercise are unfavorable, leading to stress at work, the extreme manifestation of which is Burnout Syndrome or Burnout. Studies have shown³, that the physical and psychological consequences of burnout are mainly characterized by decreased self-esteem, symptoms of fatigue, anxiety, depression and depression and irritability and the presence of somatic problems. Add to this, the economic consequences such as loss of productivity, absenteeism⁴, Nevertheless, many studies on Burnout among farmers have highlighted common external components : the financial situation of the person, his general state of health, as well as the lack of free time. Added to this is the pressure of time.

In Morocco, agriculture occupies a prominent place in the national economy and, as in all countries, it faces many factors qualified as risk, the objective of this study is to determine the generating factors of the Burnout. Among farmers at the province of Khenifra, Morocco, as

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well as the collection of some data on the main braiders of the agrarian environment

.Material and Method

1) Population and study area

The target population for this study is farmers (n = 58) who are all from the province of Khénifra. The choice of respondents is made in a simple random way. However, there has been a lot of reluctance on the part of the operators, especially women. Khénifra is a province in the Beni Mellal-Khénifra region of Morocco.

2) Sampling procedures

A descriptive questionnaire presenting the characteristics of the sample (socio-demographic characteristics, lifestyle, etc.) accompanied by the burnout Maslach inventory was completed by myself after a face-to-face interview with the respondent. Consent was held to explain to farmers the ethical aspect, including voluntary and anonymity of the survey.

3) Maslach Burnout Inventory Tool (MBI)

The Maslach Burnout Inventory (MBI) is used to assess the state of burnout⁵, It is composed of 22 elements divided into three dimensions : Emotional exhaustion (EE) assessed using nine items, dehumanization of the relationship (CD) or “depersonalization”. (DP) (Five points) and personal achievement (PA) (eight points). Each element is rated from 0 to 6. A high level of burnout is manifested by high scores for the EE and DP subscales, combined with a low score for the AP subscale, with low-level inversion exhaustion⁶.

Results

I/ Sociodemographic characteristics of our sample

Out of 58 interviews, no woman wanted to be interviewed, so the cases answering our interviewee are male and are all farmer farmers. The average age of these respondents is 53.69 ± 0.79 years, with a minimum age of 44 years and a maximum age of 68 years. The intra-group dispersion expressed by the value of the coefficient of variation (11.19%) thus confirms homogeneity in the ages of the respondents. The marital status of the interviewed farmers shows that only 5 farmers are widowed single and 91.4% (n = 53)

are married. The distribution of farmers according to the number of children shows that the average is 3.17 ± 0.23 children, with a median of 3 children and the minimum is 0 children and the maximum is 7 children. The coefficient of variation is 54.89%, a fairly high rate shows a large variation in the number of children between respondents. The shape indicators (asymmetry coefficient = -0.067 and flattening coefficient = -0.47) confirm that the distribution is almost completely compatible with Gaussian conditions. However, the distribution of farmers according to their educational attainment shows that 56.9% (n = 33) of the interviewees reached a primary level or college, 32% (n = 19) stopped primary school and 6 farmers stated that they reach high school level and more. On the other hand, the distribution of surveyed farmers by socio-professional category shows that 55.2% (n = 32) claim to be part of “farmers on average exploitation”, 36.2% (n = 21) are among the “small farmer” and 8.5% (n = 5) who have reported as a farm manager. Regarding the average duration of exercise expressed in years in the agrarian field, either as a farm manager or farmer’s aide or family member, the average is 25.45 ± 1.07 years, the minimum of years is 14 years and the maximum is 40 years, with a 95% confidence interval ranging from 23.30 ns and 27.59 years. For the number of hours spent working, the average is 7.22 ± 0.16 hours, of which a minimum of 6 hours and a maximum of 10 hours, with a confidence interval of 5% error, 6.91 hours to 7.52 hours. More than 70% of farmers reported that they live near the workplace compared to 27.6% (n = 16) who nee

II. Study of Burnout (MBI Scale (Maslach Burn Out Inventory)

For a good assessment of the state of exhaustion among farmers in our sample, we will evaluate the following three dimensions : Burnout is typically linked to a relationship with a job that is experienced as difficult, tiring, stressful ... For Maslach,[7] he is different from a depression because he would be separated during rest. The depersonalization, or loss of empathy, is characterized by a decrease of positive consideration towards the others (family, colleagues ...), it is an attitude where the emotional distance is important, observable by cynical speeches, depreciative, or even indifference. Personal accomplishment is a “safety valve” feeling that would ensure a balance in case of

burnout and depersonalization. It ensures a flourishing at work, a positive outlook on professional achievements.

Table 1: Distribution of the farmers surveyed according to the size and degree of exhaustion

Dimension	Degree		
	Low	Moderate	High
Emotional exhaustion (N = 58)	7 (12.1%)	21 (36.2%)	30 (51.7%)
Depersonalization (N = 58)	14 (24.1%)	25 (43.1%)	19 (32.8%)
Personal accomplishment (N = 58)	34 (58.6%)	21 (36.2%)	3 (5.2%)

Ø Emotional exhaustion (SEE)

The results of the classification of scores in our distribution show that 51.7% (n = 30) of farmers are at a high level of emotional exhaustion, compared to 12.1% (n = 7) of these farmers showed a low level of emotional exhaustion. However, 36.2% (n = 21) of the farmers interviewed had a moderate level. These are qualified people of risk because they could be converted to a high level of emotional exhaustion.

Ø Depersonalization (SD)

The results of this analysis show that 32.8% (n = 19) of these respondents are in a high state of depersonalization, compared to 24.1% (n = 14) who developed a low degree of depersonalization. In addition, 43.1% (n = 25) were in a moderate state of depersonalization, so this category of farmer is to be watched and is at risk of becoming a high state of depersonalization.

Ø Personal accomplishment (PA)

The results of this classification show that 58, 6% (n = 34) have a low degree of accomplishment, 36, 2% a moderate degree and the end 5, 2% (n = 3) are raised an accomplishment.

III / Global analysis of the three dimensions of burnout

It appears from this table that emotional exhaustion is positively correlated with depersonalization ($r = 0.233$; $p < 0.047$) and negatively with achievement ($r = -0.281$; $p < 0.033$). However, the performance and depersonalization nt moves in the opposite direction but

a non-significant ($r = -0.129$; $p < 0.335$). On the other hand, the farmers are much more tired and too stressed, with a drop of positive consideration towards the other benefits to their family member, colleagues ..., these farmers have a fear of positive insurance on the achievements professionals. According to the results of the distribution of farmers surveyed according to the level of exhaustion by bringing together the three dimensions. People who have developed high emotional exhaustion, high depersonalization and low achievement are referred to as people in difficulty, so it requires treatment under the supervision of a specialist. The results of this combined analysis shows 18.96% are The person in a state of burnout while 12.07% are in a high state of emotional exhaustion, low achievement and a moderate depersonalization.

This table shows that the variable concerning the reason for choosing this occupation by inheritance or investment was significantly related to the dimension of emotional exhaustion, to the dimension of depersonalization and completion. On the other hand, the marital status, the impact on the entourage and the sleep disorder has been significantly associated with emotional exhaustion. We also found a significant link between sport practice and achievement. On the other hand, single farmers who chose this trade by inheritance have been very emotionally exhausted, this has a direct effect on the relationship with the family and these people have suffered from sleep disorder. For depersonalized individuals, the choice factor is a very important risk factor. However, in people with low achievement and in addition to the choice factor, sport is a second factor of burnout.

Table 2: Factors of burnout

	Variable Modality		Prevalence	khi-deux (pvalue)
Emotional exhaustion	Civil Status	Married	50.94 %	6.18 (p <0.045)*
		Single	60 %	
	Reason	Heritage	62.16 %	8.19 (p <0.008)* *
		invest	30 %	
	Family repercussions	No	41, 67 %	2.74 (p <0.048)*
		Yes	68.18 %	
Sleep Disorder	No	44.19 %	3.02 (p <0.041)*	
	Yes	57.89 %		
Depersonalization	Reason	Heritage	40.54 %	4.41 (p <0.036) *
		invest	19.05 %	
Personal accomplishment	Reason	Heritage	72.97%	13.73 (0.001) **
		invest	33.33 %	
	Rport	No	73.08%	3.27 (p <0.030) *
		Yes	46.87%	

* : significant difference at 5% ; ** : significant difference at 1% ;

Discussion

The subject of our study was focused on work stress or burnout among farmers. This category represent an under-researched group in this area. Burnout studies focusing on the farming sector are available for only a few countries, such as France⁸⁻⁹ and Finland¹⁰. We decided to investigate burnout in Swiss agriculture for two reasons. First, we see the need to close the research gap in terms of prevalence and predictors of burnout in agriculture. For about 5 years now, the Swiss agricultural press has increasingly published case stories about burnout in agriculture; nevertheless, empirical studies are still lacking. Also, as we know from the studies mentioned above, burnout can have serious consequences not only for the psychological and physical health of affected persons but also for their surrounding system¹¹⁻¹². It is obvious that burnout prevention is better than therapy, and overlooked burnout symptoms worsen over time and can even lead to suicide¹². Besides personal consequences, burnout known to reduce the person's working productivity¹³, with consequences

for animal welfare and the whole production process on the farm. In Swiss agriculture, work loss can hardly be compensated. Farming is a stressful occupation. Farmers face many stressors, including long working hours, time constraints, unpredictable weather conditions, uncertain markets, untimely equipment breakdowns, social and geographical isolation, and regulation. According to the fourth European Working Conditions Survey carried out in 31 European countries¹⁴, 32% of agricultural and fishery workers reported that work related stress affects their health. In the other occupational sectors, this percentage drops to 22%. A study among the French population of farmers revealed that during a 3-year period (2007–2009) suicide accounted for 15% of the men's deaths and for 6.8% of the women's deaths¹⁵. In addition, compared to other professions, farmers have a higher rate of depression and suicide¹⁶⁻¹⁷⁻¹⁸. In a study of 17 states in the United States, the suicide rate was highest in three occupational groups: agriculture, fishing and forestry¹⁹. In 2018, according to a study in France, the statistical analyzes revealed eight factors according to different aspects of the stressors at work of the farmers:

the workload and the lack of time, the uncertainty on the future and the financial market, the pressure of agricultural legislation, social and geographical isolation, financial anxiety, associated conflicts or family members, family succession of the farm and unpredictable interference in agricultural work. The internal consistency of the eight subscales was satisfactory. The correlation between these eight dimensions and burnout on the one hand and desperation on the other side support the validity of the criterion scale ²⁰.

Conclusion

Farmers have confessed that burnout is a risk factor for their health; it has led to some to a breaking point such as an accident or a depression, so influence on performance. In other words, the study found that factors related to familiar heritage and lack of recreation are factors that favor burnout, other factors, such as a difficult financial situation, and conflict-related conflicts. The entanglement of work and family are more determining, the occurrence of a burnout is always very individual.

Significance Statement:

That can be beneficial for health authorities. This study will help the researchers to uncover the critical areas of psychological health that many researchers we're not able to explore. Thus, arrive at a new theory on the assessment of burnout among caregivers in the Moroccan context may.

Conflict of Interest: No conflicts of interest.

Ethical approval: The procedures were carried out in accordance with the recommendations of the Internal Ethics Committee of the Ibn Tofail, University Kenitra. This procedure were examined and approved by the committee.

Source of Funding: This work is not financial

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Hemostatic Parameter of Acute Lymphoblastic Leukemia-L1 with Hyperleukocytosis

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Abstract

Background. The increasing rate of morbidity and mortality in leukemic patients are frequently found in hyperleukocytosis state. Hyperleukocytosis is defined by a white blood cell count more than 50.000/mm³. Hyperleukocytosis still becomes an oncologic emergency that need immediate treatment. The complications that will develop if it is not immediately treated is hemostatic disorder such as intracranial bleeding and pulmonal bleeding.

Objective. This study aimed to assess the differentiation of hemostatic parameters between ALL-L1 with hyperleukocytosis and without hyperleukocytosis

Methods. The study was a cross sectional study at conducted in DR. Wahidin Sudirohusodo Hospital from November 2016 to April 2017 with seventy-two patients aged 1 month–18 years old were diagnosed with ALL-L1 based on BMP result. They were divided into two groups, 31 patients with hyperleukocytosis and 41 without hyperleukocytosis. Then they were assessed by hemostatic parameters laboratory examination (Platelet, PT, APTT, D-Dimer, and Fibrinogen).

Result. There was no significant difference in platelet count, PT, APTT, D-Dimer and fibrinogen levels between ALL-L1 patients with hyperleukocytosis and without hyperleukocytosis. Mean of platelet count with p value = 0.621, mean PT with p value = 0.429, mean APTT with P value = 0.918, mean D-Dimer with p value = 0.882 and mean fibrinogen with p value = 0.455.

Conclusion. There was no significant difference of haemostatic parameters between ALL-L1 patients with hyperleukocytosis and without hyperleukocytosis.

Keywords: hemostatic parameters, ALL-L1, hyperleukocytosis

Introduction

Leukemia is a malignancy of the hemopoietic system, that is the maligant transformation of progenitor or prekursor of blood cell which forms a malignant cell clone, marked by uncontrolled proliferation which cause

constringency that lead to bone marrow failure and infiltration to other tissues.¹

Epidemiologically, the incidence of acute leukemia is about 30% to 40 % of entire malignancy in children. There are 2 types of acute leukemia, Acute Lymphoblastic Leukemia (82%) and Acute Myeloblastic Leukemia (17%). approximately 3000 new cases of ALL occurred every year in America, 5000 in Europe, and about 2000-3000 cases in Indonesia. The peak of incidence occurs at age of 2-5 years. The average of incidence in children under 15 years is 4-4.5 cases / 100,000 per year.² meanwhile, the most common malignancy in Pediatric Departement of DR Wahidin Sudirohusodo Hospital, Makassar during 2013 was acute leukemia (96%).³

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Increased morbidity and mortality in leukemia mostly found in patients with hyperleukocytosis. Hyperleukocytosis can be present in 9-13% of ALL patients. Hyperleukocytosis is defined as an increase of white blood cell in the peripheral blood exceeding 50,000/mm³. This excessive increase is due to disruption of the white blood cell release from the bone marrow. Hyperleukocytosis may cause increased blood viscosity, blast cell aggregation and thrombus occurred in the microcirculation. Beside, due to the size of the blast cells are bigger than mature white blood cell cells, and not easily change the shape of the blast cells cause blast cell easily trapped and cause occlusion on microcirculation. This is called leukocytosis. Leukocytosis will cause poor perfusion and hypoxia, anaerobic metabolism, lactic acidosis, and eventually cause damage to blood vessel walls and bleeding.⁴

Another concept suggests that in leukemia, ineffective phagocytosis of neutrophils may cause the persistence of non-digestible bacteria which lead to inflammation and hidden microcirculation disorder such as extensive tissue hypoxia, endothelial cell damage, coagulation system activation and microcirculatory, and mitochondrial distress syndrome. These factors are important in determining the potential that lead to sepsis, but this condition is not detectable clinically so that the patient shows a stable condition.⁵

In addition, other theories suggest that in leukemia, there is release of procoagulant material from leukemic cell blast. The pathogenesis of this condition is very complex and involves various mechanisms such as coagulation activation by procoagulant substances released by leukemic cells, fibrinolytic path failure, and endothelial changes.⁶ Considering hyperleukocytosis can cause various complications in leukemia, it is necessary to prove whether hyperleukocytosis has the potential to cause hemostatic disorder. Therefore, it is important to do the research to find out the impact of hemostatic disorders in children with leukemia who have hyperleukocytosis.

Previous study by Faranita et al.⁷ found the hemostatic system is maintained by interactions between endothelial cells, platelets, coagulation proteins and fibrinolytic systems. In injury, these four elements play a role in coagulation system. Hematological malignancies

can alter plasma molecule levels including in terms of coagulation and fibrinolysis, such as fibrinogen, PT, APTT and D-Dimer. There is an evidence of increased activation of the coagulation system in acute leukemia patients, although its pathogenesis remains unclear.

Hyperleukocytosis is one of the oncologic emergencies that require prompt treatment. If this condition is not handled appropriately and immediately, this may have a detrimental effect on leukemia patients due to complications.

Material and Method

Design and research variable

This cross-sectional study was conducted in DR Wahidin Sudirohusodo Hospital Makassar, during November 2016 until April 2017. The blood sampling was conducted at the laboratory of DR Wahidin Sudirohusodo Hospital. The research variables consist of: independent variable (hyperleukocytosis), dependent variable (hemostatic parameters (number of platelets, PT, APTT, Fibrinogen level and D-Dimer level)), confounding variable (sepsis), control variable (LLA-L1), intermediary variable (Hyperleukocytosis process in ALL-L1 causing impaired hemostatic parameters), and random variables (age, sex, genetics, nutritional status)

Population and sample

Accessible populations are all patient aged 1 month - 18 years old with ALL-L1 admitted to child care unit of Dr. Wahidin Sudirohusodo Hospital. Samples were all accessible populations who meet the inclusion and exclusion criteria.

Method and data collection

Data collection was obtained from the patient diagnosed with leukemia aged 1 month - 18 years old who meet the inclusion criteria. and then register number, age, sex, nutritional status, vital signs (blood pressure, pulse, temperature and breathing) was recorded. Blood samples were drawn for platelet, PT, APTT, Fibrinogen levels and D-Dimer levels. Bone marrow examination was also done. The results observed were platelet count, PT and APTT, Fibrinogen level, and D-Dimer level in patients diagnosed with ALL-L1 based on Bone Marrow

Punction.

87.47) respectively. (Table 2)

Data Analysis

All data obtained are recorded in the research data form, and then grouped by purpose and data type. The following statistical methods were chosen: 1) univariate analysis and 2) bivariate analysis.

Result

Of 93 patients with a diagnosis of leukemia that meets the inclusion criteria, there were 72 ALL-L1 patients consists of 31 patients with hyperleukocytosis and 41 patients without hyperleukocytosis. There were 22 patients (5 patients with Aplastic Anemia, 4 patients with ANLL-M2, 1 patient with ANLL-M3, 1 patient with ANLL-M4, 5 patients with CML, and 6 patients with MDS).

Based on the characteristics, most of the patients were male (65.3%) aged <10 years old (70.8%), with good nutritional status (38.9%). (Table 1)

Characteristics of hemostatic parameters in ALL-L1 showed that platelet count had a range 3,000-129,000 with mean 37916.67 ± 36100.31 . White blood cell was range from 1,100-423,000 with mean 53480.69 ± 74780.86 . The range of Hemoglobin level was 2.5-10.1 and mean of 37916.67 ± 36100.31 . The range of PT, APTT, D-Dimer, and Fibrinogen were 10.1-90.0 (mean 13.068 ± 9.40), 23.1-180.0 (mean 32.41 ± 18.68), and 0.6-20.6 (mean 2.85 ± 2.83), 63.6-477.2 (mean $284.79 \pm$

Sex distribution based on white blood cell count in ALL-L1 showed that in the hyperleukocytosis group there were more male (71%) than female (29%), and so does the non-hyperleukocytosis group with percentage were 61% and 39% respectively. Statistical analysis in the table above shows that there is no significant difference of sex distribution based on white blood cell count in patients with ALL-L1 with $p = 0.527$ (Table 3).

The age distribution based on white blood cell count in ALL-L1 showed that in the hyperleukocytosis group there were 51.6% of patients <10 years old and 48.4% were ≥ 10 years old. While in the non-hyperleukocytosis group there were 85.4% of patients <10 years old and 14.6% were ≥ 10 years old. Statistical analysis in table 4 showed that there was a significant difference of age distribution based on white blood cell count in ALL-L1 with $p = 0.003$, while the percentage of ≥ 10 years was higher (48.4%) in ALL-L1 Hyper leukocytosis (Table 4).

Comparison of hemostatic parameters based on the number of white blood cell in patients with ALL-L1 showed that there was no significant difference in mean platelet count between hyperleukocytosis and non-hyperleukocytosis with $p = 0.621$. There was no significant difference of PT, APTT, D-dimer, and fibrinogen level between hyperleukocytosis and non-hyperleukocytosis with p value were 0.429, 0.918, 0.882, and 0.455 respectively. (Table 5).

Table 1. Characteristics of subjects (no=72)

Variable	Category	n	%
ALL-L1	Hyperleukocytosis	31	43.1
	Non-hyperleukocytosis	41	56.9
Sex	Male	47	65,3
	Female	25	34,7
Age	<10 years	51	70,8
	≥ 10 years	21	29,2
Nutritional state	Malnutrition	14	19,4
	Less nutrition	25	34,7
	Good nutrition	28	38,9
	Overweight	3	4,2
	Obesity	2	2,8

Table 2. Characteristic of Hemostatic Parameter in ALL-L1

Variable	mean±SD	Minimum	Maximum
Platelet	37916.67±36100.31	3000	129000
WBC	53480.69±74780.86	1100	423000
Hb	7.124±1.93	2.5	10.1
PT	13.068±9.40	10.1	90.0
APTT	32.41±18.68	23,0	180.0
D-DIMER	2.85±2.83	0.6	20.6
Fibrinogen	284.79±87.47	63.6	477.2

Table 3. Sex distribution on WBC in ALL-L1

Sex	ALL-L1		Total
	Hyperleucocytosis n (%)	Non- hyperleucocytosis n (%)	n (%)
Male	22 (71.0%)	25 (61.0%)	47 (65.3%)
Female	9 (29.0%)	16 (39.0%)	25 (34.7%)
Total	31 (100.0%)	41 (100.0%)	72 (100.0%)

Chi Square

p=0.527 (p>0.05)

Tabel 4. Age distribution based on WBC in ALL-L1

Age	ALL-L1		Total
	hyperleucocytosis n (%)	Non- hyperleucocytosis n (%)	n (%)
<10 years	16 (51.6%)	35 (85.4%)	51 (70.8%)
≥10 years	15 (48.4%)	6 (14.6%)	21 (29.2%)
Total	31 (100.0%)	41 (100.0%)	72 (100.0%)

Chi Square

p=0.003 (p<0.05)

Table 5. Comparison of Hemostatic Parameters Based on WBC in ALL-L1

Hemostatic Parameters		LLA -L1	
		hyperleucocytosis (n=31)	Non hyperleucocytosis (n=41)
Platelet	Minimum	3.000	3.000
	Maximum	121.000	129.000
	Mean	36096,77	39292.68
	SD	31809.17	39368.29
	p = 0.621b		
PT	Minimum	10.2	10.1
	Maximum	19,9	90
	Mean	12.45	13.54
	SD	2.50	12.31
	p = 0.429b		
APPT	Minimum	23	23,2
	Maximum	50.4	180
	Mean	30.56	33.82
	SD	6.72	24.10
	p = 0.918b		
D-Dimer	Minimum	0.6	0.6
	Maximum	5,5	20.6
	Mean	2.57	3.06
	SD	1.57	3.51
	p = 0.882b		
Fibrinogen	Minimum	128.5	63.6
	Maximum	453.5	477.2
	Mean	275.86	291.54
	SD	70.67	98.62
	p = 0.455a		

^aIndependent T Test ^bMann-Whitney

Discussion

This study showed no significant difference in mean platelet count, PT, APTT, D-dimer levels, and fibrinogen levels among patients with hyperleukocytosis and non-hyperleukocytosis LLA-L1 patients with p value of 0.621 platelet mean, PT 0.429 mean APTT 0.918, mean

D-dimer 0.882, and mean fibrinogen 0.455.

Hyperleukocytosis is one of the oncologic emergencies that prompt immediate treatment.⁸ Increased morbidity and mortality in leukemia patients are often found in hyperleukocytosis. If this condition is not treated promptly and correctly, it can lead to

death due to intracranial and/or pulmonary hemorrhage, as well as metabolic disturbance due to leukemia cell lysis.⁹

Patients with ALL-L1 were mostly male, which is similar to a study by Ramadhina et al.⁵ in Cipto Mangunkusumo Hospital, and Permatasari et al.¹⁰, with incidence percentage were 61% and 64.4% respectively.

Most subjects were <10 years (68.1%), the youngest age was 2 months old and the oldest age was 16 years old 7 months old. The same thing was also found in a study by Budiyanto et al.¹¹ and Falakh et al.¹², with percentage of patients aged <10 years were more than 60%.

Furthermore, for nutritional status, in this study most people with ALL-L1 was well nourished (38.9%). This suggests that the rate of diagnosis greatly influences disease progression and nutritional status. So that is necessary to have knowledge about leukemia diagnosis. One of the clinical manifestations of leukemia is bleeding. The most common bleeding manifestations include petechiae, purpura or ecchymosis, occurring in 40-70% of patients with acute leukemia at the time of diagnosis. The most common sites of bleeding are the skin, eyes, nasal mucous membranes, gingiva and gastrointestinal tract. Life-threatening hemorrhages usually occur in the gastrointestinal tract and the central nervous system. This bleeding manifestation arises as a result of various hemostatic disorders.⁶

The hemostatic system is maintained by interactions between endothelial cells, platelets, coagulation proteins and fibrinolytic systems. At the injury state, all four elements work together in the coagulation system. Haematological malignancies can alter plasma molecule levels including in terms of coagulation and fibrinolysis, such as fibrinogen, PT, APTT and D-Dimer. There is an evidence of increased activation of the coagulation system in acute leukemia patients, although its pathogenesis remains unclear.⁷

In this study there was no significant difference of distribution and mean of PT and APTT in patients with ALL-L1 hyperleukocytosis and non-hyperleukosytosis. This suggests that blast cells infiltrated to the liver will cause a decrease in synthesis of coagulation factors. Then in hyperleukocytosis, leukocytosis is easily

occurs that will result in the occurrence of anaerobic metabolism and endothelial damage of blood vessels and will activate the coagulation system.

Wijaya et al.¹³ in a study on the activation of coagulation system and D-Dimer levels in acute leukemia patients at Dr. Cipto Mangunkusumo Hospital found that there was an increase in D-Dimer levels in all ALL-L1 patients at the time of initial diagnosis but PT and APTT were within normal limits. In Ichikawa et al.¹⁴ study, it was mentioned that D-Dimer levels in the hyperleukocytosis group were higher than in the non-hyperleukocytosis group. Likewise, a study by Athale et al (2010) reported mean D-Dimer levels 2,766 (SD 2,385) ng / ml in the hyperleukocytosis group.

Leukemia and other malignancies are associated with high-risk hyper coagulant conditions for thrombohemorrhagic complications. Clinical complications range from localized thrombosis to severe hemorrhagic due to DIC. In leukemia, DIC complications occur due to the release of procoagulant material (thromboplastin-like substances) from blast cells. The procoagulant material is such a tissue factor that will form a complex with factor VIIa thus activating the coagulation cascade through the extrinsic pathway that forms the fibrin systemically. Ongoing coagulation will decrease plasma antithrombin III levels which are important inhibitors for the coagulation process. Then inhibit fibrinolytic system due to the maximum coagulation activation. This inhibition is caused by an increase of plasminogen activator inhibitor type 1 (PAI1) as the major inhibitor in the fibrinolytic system.

There were no significant differences in distribution and mean of fibrinogen in the hyperleukocytosis and non-hyperleukosytosis group. Most fibrinogen was normal in both groups. However, there are also some patients who have elevated fibrinogen levels. Increased fibrinogen levels show that in leukemia, the risk of infection cannot be ignored and fibrinogen is an acute phase reactant released during infection even though this condition is not clinically detectable and the patient's condition as if stable.⁵

There was no significant difference between patients who had thrombocytopenia with high PT and APTT between hyperleukocytosis and non hyperleukocytosis group. This suggests that in leukemia infiltration of

blast cells to the liver and cause synthesis of coagulation factors.

Likewise, the distribution of thrombocytopenia with hypofibrinogenemia, there was no significant difference between hyperleukocytosis and non-hyperleukocytosis group. This suggests that in both groups, endothelial vessel damage occurs due to inflammatory cytokines that will lead to activation of the coagulation system.

Research Xiao et al.¹⁵ found that the incidence of coagulation disorders (PT, APTT, D-Dimer and Fibrinogen) in ALL patients had correlation with the number of blast cells present in the bone marrow.

In conclusion, there was no significant difference in fibrinogen levels between patients with ALL-L1 hyperleukocytosis and non-hyperleukocytosis. There was no significant difference in D-Dimer levels between people with ALL-L1 who had hyperleukocytosis and who had no hyperleukocytosis. The authors recommend that further study to have larger sample quantities and use prospective cohort study to evaluate the differences in hemostatic parameters between patients with ALL-L1 hyperleukocytosis and non hyperleukocytosis.

Conflict of Interest: None.

Funds: None.

Ethical Clearance: Taken from ethic committee of Faculty of Medicine, Hasanuddin University.

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Serum Angiotensin-1 & Angiotensin-2 as Serum Biomarkers for Ectopic Pregnancy and Missed Miscarriage

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Abstract

Background: The angiotensins are proteins which belong to the family of angiogenic proteins, Angiotensin-1 (Ang-1) and (Ang -2) are two critical regulators with different functions of vascular development and angiogenesis indicators for placental growth and maternal vascular health in early pregnancy and miscarriage .

Objective: To evaluate whether a single serum measurement of

angiotensin-1 and angiotensin-2 at 6-8 weeks gestation can differentiate failed pregnancies, whether ectopic pregnancies or missed miscarriages, from healthy intrauterine pregnancies.

Methods: This study was a case control study conducted at Obstetric & Gynecological Department of Baghdad Teaching hospital /Medical city through the period from 1 st of March to end of August, 2017

Patient and method: the study included 93 pregnant women as following:

- a- 33 women with intrauterine viable pregnancy
- b- 30 pregnant women diagnosed as first trimester miscarriage.
- c- 30 women with ectopic pregnancy(proved by histopathology)

Full history was taken and clinical examination was done blood sampling was performed ,full routine investigation (complete blood picture , renal and liver indices ,blood group) and measurement of angiotensin 1 and 2 levels and B.HCG were taken.

Results: Mean angiotensin-1 and angiotensin-2 levels was significantly lower among women with ectopic pregnancy ($p < 0.001$), in same way, there was a highly significant reduction in angiotensin-1 and angiotensin-2 mean among women with miscarriage than healthy women ($p < 0.001$).

Angiotensin ratio was significantly lower among women with ectopic

Pregnancy ($p < 0.001$). Validity results of angiotensin-2 in prediction of ectopic pregnancy and miscarriage in early pregnancy were better than angiotensin-1 and human chorionic gonadotropins ratio titre. Angiotensin 1&2 was not significant in differentiation between ectopic pregnancy and missed miscarriages ($p = 0.5$).

Conclusion: Angiotensin-1 and angiotensin-2 are lower in women with ectopic pregnancies and miscarriages than healthy women.

Keywords: *angiotensin, ectopic pregnancies, miscarriages*

Introduction

Ectopic pregnancy and miscarriage are two common complications seen in early pregnancy¹ . Ectopic

pregnancy denotes the implantation of the gestational sac outside the uterus and is the most common life threatening emergency in early pregnancy² . Miscarriage

is the most common complication of pregnancy miscarriage and ectopic pregnancy present with similar features of abdominal pain and vaginal bleeding in the first trimester of pregnancy^{3,4}.

Neovascularization, or new vessel formation, is essential for placental growth throughout gestation and is driven by changes in the balance between pro- and anti-angiogenic factors present in the extracellular milieu⁵.

Angiopoietin 1 (Ang-1) and angiopoietin 2 (Ang-2) are angiogenic factors that play a critical role in the development of the placental vascular system⁶.

The aim of the current study is To measure the level of serum angiopoietin -1 and angiopoietin -2 at early pregnancy & To evaluate whether a single serum measurement of angiopoietin-1 and angiopoietin-2 at 6-8 weeks gestation can differentiate failed pregnancies, whether ectopic pregnancies or missed miscarriages, from viable intrauterine pregnancies.

Methods:

This study is a case control study conducted at Obstetric &

Gynaecological Department of Baghdad Teaching hospital /

Medical city through the period from 1st of March to end of August, 2017. Study population 60 pregnant women with confirmed diagnosis of ectopic pregnancy and missed miscarriage (30 women with ectopic pregnancy and 30 women with missed miscarriage) were Inclusion criteria for all groups. In addition of having the specific diagnostic criteria of pregnancy with ectopic, missed miscarriage and viable intrauterine

Pregnancy, they should meet the following condition to be admitted in the study:

1. Reproductive age group women
2. Early pregnancy (6th-8th weeks of gestational age).

3. Free from any chronic medical disease like e.g. : diabetes mellitus or hypertension full history and examination for all pregnant women were done, the pregnant women were referred to ultrasonography and confirmed diagnosis of ectopic pregnancy and missed miscarriages was made by Gynaecology Specialist. A 5ml blood sample was taken in first visit before management from venous puncture for all pregnant women of three study groups. These blood samples were centrifuged in laboratory of the hospital for assessment of angiopoietin 1, angiopoietin 2 Measurements of angiopoietins .The angiopoietin 1 was measured in private laboratory using Elisa kit(CUSABIO ®). This assay had normal limit value of 1.25-80 ng/ml, the angiopoietin 2 was measured in private laboratory using Elisa kit (CUSABIO ®) This assay had normal limit value of 1.25-80 ng/ml. HCG(The human chorionic gonadotropin) serum concentrations were measured in private laboratory by an electrochemiluminescence immunoassay (ECLIA) intended for use on the automated analyzer Modular Analytics E170. The results were expressed as HCG titer .

As mean angiopoietin-1 and angiopoietin-2 levels was significantly lower among women with ectopic pregnancy ($p<0.001$), in same way, there was a highly significant reduction in angiopoietin-1 and angiopoietin-2 mean among women with miscarriage than IUP women ($p<0.001$). Angiopoietin ratio was significantly lower among women with ectopic pregnancy ($p<0.001$). Mean HCG titer was significantly higher among IUP women than miscarriage and ectopic pregnancy women ($p<0.001$). Post hoc test revealed a highly significant difference in angiopoietin 1 and 2 levels between women with IUP and each of ectopic pregnancy and missed abortion women separately ($p<0.001$). There was no significant difference in angiopoietins 1 and 2 means between women with ectopic pregnancy and those with miscarriage. Similarly the angiopoietin ratio and HCG means were significantly different between women with IUP and each of ectopic pregnancy and miscarriage women separately ($p<0.001$), while not significantly different between women with ectopic pregnancy and those with miscarriage.

Table 1: Distribution of angiopoitin 1, 2 and HCG titer according to study groups.

Variable	IUP	Ectopic	Miscarriage	P
	Mean±SD	Mean±SD	Mean±SD	
Angiopoitin 1	1050.3±235.4	668.9±83	727.8±183.9	<0.001*
Angiopoitin 2	1765.9±779.4	308.4±86.1	439.2±142.6	<0.001*
Ang2/Ang1ratio	1.73±0.75	0.47±0.16	0.66±0.36	<0.001*
HCG titer	20936.6±10891.2	2245±578.3	3473.6±1154.9	<0.001*
Post hoc test				
Angiopoitin 1	IUP vs. Ectopic			<0.001
Angiopoitin 1	IUP vs. Miscarriage			<0.001
Angiopoitin 1	Ectopic vs. Miscarriage			0.4
Angiopoitin 2	IUP vs. Ectopic			<0.001
Angiopoitin 2	IUP vs. Miscarriage			<0.001
Angiopoitin 2	Ectopic vs. Miscarriage			0.5
Ang2/Ang1ratio	IUP vs. Ectopic			<0.001
Ang2/Ang1ratio	IUP vs. Miscarriage			<0.001
Ang2/Ang1ratio	Ectopic vs. Miscarriage			0.2
HCG titer	IUP vs. Ectopic			<0.001
HCG titer	IUP vs. Miscarriage			<0.001
HCG titer	Ectopic vs. Miscarriage			0.7

*One way ANOVA test.

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for angiopoitin-1 in prediction of ectopic pregnancy were of cutoff angiopoitin-1 of 799 mg/mm and less had acceptable validity results (97% sensitivity & 100% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for angiopoitin-2 in prediction of ectopic pregnancy were of cutoff angiopoitin-2 of 467.7 mg/mm and less had acceptable validity results (100% sensitivity & 100% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for HCG titer in prediction of ectopic pregnancy were of cutoff HCG titer of 6900.5 mIU/ml and more had acceptable validity results (97% sensitivity & 100% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for angiopoitin-1 in prediction of miscarriage were of cutoff angiopoitin-1 of 912 mg/mm and less had acceptable validity results (81.8% sensitivity & 86.7% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for angiotensin-2 in prediction of miscarriage were of cutoff angiotensin-2 of 796.5 mg/mm and less had acceptable validity results (97% sensitivity & 100% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for HCG titer in prediction of miscarriage were of cutoff HCG titer of 7790 mIU/ml and more had acceptable validity results (97% sensitivity & 100% specificity).

The appropriate cut off level and the corresponding validity tests values (sensitivity & specificity) for Ang2/Ang1 ratio in differentiation between ectopic pregnancy and miscarriage were of cutoff Ang2/Ang1 of 0.48 and less had acceptable validity results (60% sensitivity & 56.7% specificity) prediction of ectopic pregnancy while Ang2/Ang1 ratio of more than 0.48 is predictive for miscarriage.

Discussion

Many methods and tools were applied by Gynaecologists to examine pregnant women with early vaginal bleeding and/or pain like transvaginal ultrasonography and serum β -HCG. Although easily use of ultrasound imaging, it still inaccurate despite high prediction outcome acquired after combining ultrasound results with clinical suspicion⁷.

In the current study found higher gravidity mean among women with miscarriage outcome ($p=0.02$). This is similar to results of Yang et al⁸ study in China which found a highly significant association between higher gravidity and miscarriage.

Similarly, our study showed that women with miscarriage history were significantly associated with high miscarriage mean ($p<0.001$). This finding is in agreement with Nikitina et al study⁹ in Russia which stated that history of miscarriage is regarded as risk factor for recurrent miscarriage in early pregnancy. Inconsistently, Hyde et al¹⁰ study in Columbia stated that genetic effect is mainly responsible of recurrent miscarriage and the role of miscarriage history is weak.

Present study revealed that angiotensin-1 and angiotensin-2 means were significantly reduced among women with ectopic pregnancy and miscarriage than

women with IUP ($p<0.001$). This finding is consistent with results of Daponte et al⁷ case control study in Greece showed that angiotensin-1 and angiotensin-2 levels among women at 6-8 weeks of pregnancy were significantly decreased among women with ectopic pregnancy and missed miscarriage.

Scheneuer et al¹¹ cohort study in Australia on 4785 women measured the angiotensin 1 and 2 levels at first trimester and found that low levels of angiotensin-1 and angiotensin-2 among early pregnant women were significantly associated with miscarriage.

The current study a finding regarding the angiotensin-1 is in agreement with results of Alsamarai et al¹² study in Iraq which included 547 women with bad obstetric history and 291 women with normal pregnancy outcome. Serological study carried out to determine IL-6, IL-17 and Angiotensin-1 using ELISA kits and observed a highly significant association between low angiotensin level and women with missed miscarriage.

In UK, Richardson et al¹³ study measured the serum concentration of angiotensin 1, angiotensin 2 and vascular endothelial growth factor receptor-1 among 2500 women at early pregnancy and detected a significant linear relationship between each of angiotensin-2 level and Flt-1 with future viability of pregnancy. The macerated placental vascular development is caused by disrupted angiogenic factors balance which leads to adverse pregnancy outcome. The angiotensins are also predicting the placental growth and maternal vascular health during pregnancy¹⁴.

A Study in Netherlands by Plaisier et al reported that miscarriages pathogenesis was highly related to vasculature premature maturation. It was shown that in pregnancies with bad outcome, placental villous growth is variable and the process of angiogenic interaction between trophoblast and the uteroplacental circulation is incomplete. The low angiotensin level is responsible of vessel destabilization and decrease in the angiogenic sprouting promoting vessel leakage¹⁵.

This study showed that Ang2/Ang1 ratio was significantly lower for women with ectopic pregnancy and miscarriage than IUP women ($p<0.001$). This finding is similar to results of Lash et al¹⁶ study in UK which used the immunohistochemistry to study angiotensins

in the proliferative, early and late secretory phase endometrium from control women as well as in the late secretory phase of women with a history of recurrent miscarriage and detected that angiopoietin ratio could be used as a biomarker for recurrent miscarriage and ectopic pregnancy.^{17,18}

Conclusion

Encouraging use of serum angiopoietins in antenatal care as biomarkers for early failed pregnancy (ectopic pregnancy and miscarriage) in high risk pregnancies. Incorporation of serum angiopoietins with other biomarkers like human chorionic gonadotropins could increase their accuracy and help in using them for early diagnosis of ectopic pregnancy and miscarriage. Further large sized longitudinal studies on benefits of serum angiopoietins in predicting adverse pregnancy outcome need to be supported.

Ethical Clearance- Taken from Baghdad Medical City committee

Source of Funding- Self

Conflict of Interest- Nil

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A Rare Case of Situs Inversus Totalis (Mirror- Image) with Sudden Death

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Abstract

Situs inversus(SI) is a rare congenital anomaly in which the visceral organs are placed reversely. This report describes the first ever case of SI with sudden death by cardiac tamponade. A 75 years old lady was admitted to the hospital with the history of fall onto the ground at home. Although resuscitation was done in emergency unit, hospital, she could not be revived and succumbed to death. The cause of death was shock due to flail chest, given by the medical officer in-charge. Autopsy revealed the situs inversus totalis and the cause of death was cardiac tamponade due to ruptured-myxoma.

Key words: *situs inversus, sudden death, ruptured-myxoma.*

Introduction

Situs inversus (SI) is a congenital condition in which the major organs are reversed or mirrored image from their normal positions¹. One literature expressed that Dextrocardia and Kartagener Syndrome is situs inversus as well and it is accompanied by sinusitis and bronchiectasis². This report describes the rare case of sudden death by ruptured- myxoma with situs inversus totalis.

Case report

An apparently healthy, 75-year-old lady was admitted to the hospital with the history of fall onto the ground, she died awhile after admission and the cause of death was given as “Shock due to the flail chest”.

Autopsy findings

General appearance revealed an average built and

nourished female body without any marks of external injury. On opening the body cavities, the first unexpected finding was an appendix at left iliac fossa (figure 1). Liver was also situated on the left side of abdominal cavity while the spleen was present on the right side (figure 2). Heart was present on the right side of the chest cavity with apex pointing towards right side (figure 3). The block of thoracic and abdominal organs were removed in “ en-bloc”. Pericardium was incised in-situ and inspected the content, which revealed huge blood clot (hemopericardium), but the heart was seemed to be normal and no features of ruptured-myocardial infarct (figure 4) were seen. There was a remnant of ruptured-myxoma at the left atrio-ventricular groove which was the source of hemopericardium (figure 5). Other organs were unremarkable apart from the reversed sides of normal positions.

Histological examination of tumour showed abundant eosinophilic amorphous loose matrix containing stellate shaped myxoma cells. No features of malignancy are seen.

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Figure 1;



Figure 2;

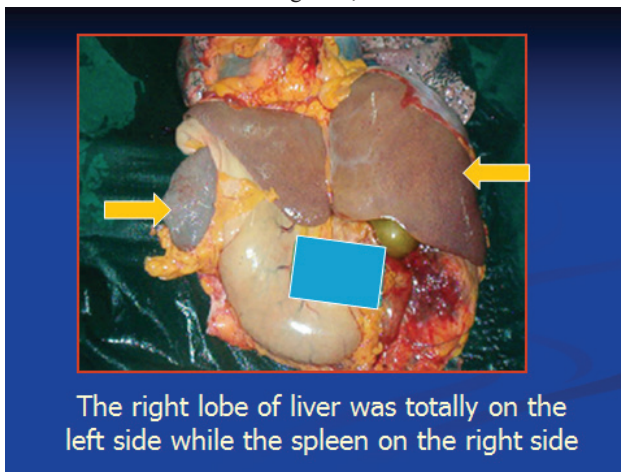


Figure 3;

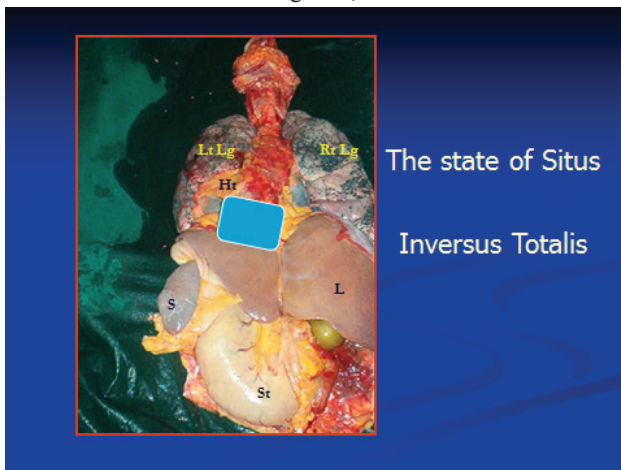


Figure 4;

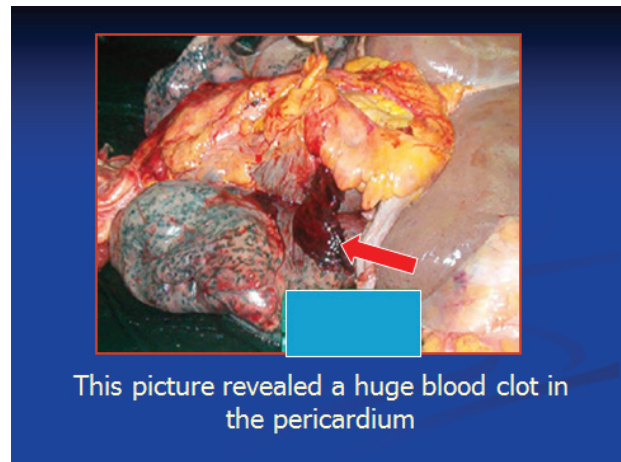
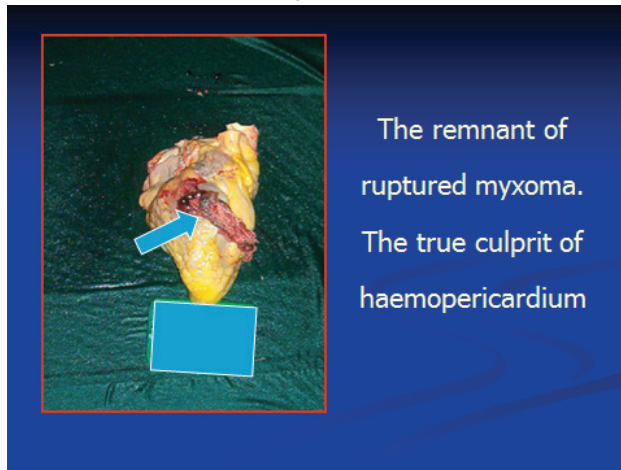


Figure 5;



Discussion

The normal arrangement of internal organs is situs solitus while situs inversus is generally the mirror image of situs solitus¹. Although cardiac problems are more common in people with situs inversus than in the general population, there is no symptom or complications of the condition until the advent of modern medicine it was usually undiagnosed¹. The exact incidence of Situs Inversus is not known because persons remain asymptomatic; however, an incidence of 6-8 per 1000 live births is reported for congenital anomalies of heart². Situs inversus totalis is a rare congenital anomaly in which general transposition of viscera while dextrocardia indicates the heart is mainly on the right and its apex points to the right³. Isolated dextrocardia usually displays situs solitus as stomach on left and liver on the right. There have been numerous reports describing the presence of rheumatic mitral stenosis with dextrocardia and/or situs inversus⁴, and some reports of Lutembacher's syndrome with dextrocardia⁴.

Cardiac myxoma, the primary cardiac tumours (PCT) are rare, accounting for 0.0017-0.03% in autopsy series⁵, in contrast to metastatic tumours of the heart which are 30 times more frequent⁴. Nearly 75% of PCT are benign and most often represented by a myxoma in 50% of cases in the adult population^{6,7,8}.

Cardiac myxoma in dextrocardia with situs inversus is an uncommon condition. On review of literature, we could find one result, J Gabriel et al presented rare case of left atrial myxoma in dextrocardia with situs inversus totalis and the tumour was successfully excised with a trans-septal approach.⁴

Our case described the presence of cardiac myxoma with situs inversus totalis. The lady lived her whole life without any symptoms of situs inversus and it was incidentally found in autopsy as a rare finding. Our first impression was cardiac tamponade which was due to ruptured myocardial infarct as it was usual finding of sudden cardiac death. However, the ruptured myxoma was revealed when the heart was removed. The coronary arteries were free of occlusion and there were no features of recent or old myocardial infarct. The heart was grossly normal apart from the malposition as dextrocardia. There was the remnant of ruptured myxoma, 7x2 cm in size at the atrio-ventricular groove on the epicardium. The other internal organs were normal. Thus, with the presence of abovementioned findings, the cause of death was opined as cardiac tamponade due to ruptured myxoma, precipitated by the flail chest because of fall onto the ground.

Conclusion

Our aim to of this report is to let the young generation of professional colleague knows that “things are not always as they seem at first glance” that the first impression might not always correct. It is unwise to give the cause of death before a complete and thorough post-mortem examination.

If any case of situs inversus is encountered at autopsy, the family should be counseled and advised to

undergo a possible screening as they are prone to have various cardiac abnormalities.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

Source of funding

Self

Ethical clearance

Necessary ethical approval was obtained from General Hospital Committee of Mandalay General Hospital, Myanmar.

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Detection of Intestinal Helminthic Infection in Rural Communities Using Concentration Method

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Abstract

This study was aimed to determine the intestinal helminthic infections (IHIs) among rural communities of Bua Yai district, Nakhon Ratchasima province, northeastern Thailand. A cross-sectional study was conducted between July 1, 2018 and June 30, 2019 among rural villagers from 22 rural villages of 2 sub-districts. The participants were randomly selected from village enrollment list after proportional allocation of the total sample size. IHIs were prepared by the mini parasep sf faecal concentrator; concentration method, and then were detected using light microscope. Data were analyzed using STATA for windows version 13 and p-value less than 5% was considered as statistically significant. Of the total 454 faecal specimens examined, 6 were positive for at least one intestinal helminthes making the prevalence 1.32%. The most prevalent helminthes were *Opisthorchis viverrini* (1.26%) and followed by *Ascaris lumbricoides* (0.39%), *Strongyloides stercoralis* (0.19%), and *Taenia spp.* (0.19%), respectively. No significant association was found between IHIs and socio-demographic characteristics ($P > 0.05$). This study reveals that the decreased infection rate is under control and elimination is possible through the prevention and control campaign from Ministry of Public Health in collaborated with network teams in this areas. However, IHIs are found in adults that were particularly apparent regarding the food borne and soil transmitted species of helminthes. A greater focus on intervention is required by improving personal hygiene and sanitation to prevent the spread of IHIs. Using MPFC indicates that concentration method is useful in the rural communities, increasing the yield of parasites with greater processing time and cost.

Keywords Detection, Intestinal helminthic Infection, rural community, Thailand

Introduction

The most common intestinal helminthic infections (IHIs) are the neglected tropical diseases (NTDs). These indicate that more than 1.5 billion people, or 24% of the world's population, are infected with soil-transmitted helminthic infections (STHs) worldwide¹. In the ASEAN countries, it is estimated that 300 million people are infected with IHIs². In 2014, the national prevalence rate of IHIs was 18.1% among 15,555 Thais with a high prevalence rate of liver fluke and hookworm infections

in certain areas of the country³. Humans become infected by accidental ingestion of eggs at their infective stages or through penetration of the skin by infected larvae in soil, depending on the nematode species. People with infections of heavier infections can cause a range of symptoms including intestinal manifestations; abdominal pain and diarrhea, general malaise and weakness, malnutrition, impaired growth and physical development. Infections of very high intensity can cause intestinal obstruction that should be treated surgically. In the case with light infection and intensity usually do not suffer from the infection¹. There are urgent needs to expand surveillance activities in rural areas of Thailand, as well as to ensure mass drug administration is provided to populations at risk for intestinal helminthes infections.

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Previous studies of the prevalence of intestinal helminthes among villagers showed a low incidence in Bua Yai district, Nakhon Ratchasima province⁴. However, no information was available regarding the prevalence and intensity of IHIs among the residents in the level of villages. Recently, Mini Parasep SF Faecal Concentrator (MPFC); a concentration diagnosis tool is used for detected the intestinal parasitic infection. MPFC is the solvent-free faecal parasites concentrator represents a simple and useful method for isolating and identifying helminth's eggs and larvae, and protozoal cysts. The closed concentration system allows rapid, reliable, and safe detection of intestinal parasites by inexperienced technologists⁵⁻⁸. This data may able useful for further tool support the epidemiological survey in the community.

Materials and Method

Study design and area

A cross-sectional survey was carried out from July 1, 2018 and June 30, 2019 and included people living in 22 rural villages located in Khun Thong (12 villages) and Nong Bua Sa-At (10 villages) sub-district, Bua Yai district, Nakhon Ratchasima province, northeastern Thailand. The study area is located 355.4 km northeast of Bangkok and covers an area of 548.5 km². Participants were randomly selected from each village using a voluntary sampling method. A total of 454 volunteers were recruited. Data on socio-demographic characteristics was collected using a questionnaire. All participants provided their own written consent before submitting stool specimens.

Faecal collection and examination

Clean plastic containers were distributed to the participants at enrollment with detailed instructions about the procedure for faecal specimen collection. All faecal samples were collected early in the morning and conserved in the iceboxes before transportation to the laboratory at the Parasitic Disease Research Center, Institute of Medicine, Suranaree University of Technology. Each specimen was prepared and examined for the presence of intestinal helminthes organisms by mini-parasep sf faecal concentrator^{8,9}. Each specimen

was examined under the microscope, initially screened with a low-power objective lens. Suspected intestinal helminthes objects were subsequently examined under a high-power objective. All of samples were examined by two laboratory technologists. Patients who were infected with intestinal helminthes and other known parasites were treated with anti- intestinal helminthic drugs.

Statistical analysis

Statistical analyzes were performed using the computer program; STATA for windows version 13 (StataCorp LLC, Lakeway Drive, College Station, Texas, USA). Socio-demographic characteristics of the participants were presented as frequencies and percentages for the categorical variables. The different of infection between the categorical variables were assessed using Chi-square. Multivariate logistic regression analysis was performed to estimate the odds ratio (OR) and 95% confidence interval (95% CI) to assess the associations between potential risk factors and prevalence of IHIs. A *P*-value of <0.05 was considered to be statistically significant.

Results

A total of 454 participants (296 male, 158 female) were included. The overall prevalence of IHIs was 1.32% (6/454). The prevalence rate was frequently found in males 1.32% (6/454), aged 31–40 years old 1.32% (6/454), primary school 1.32% (6/454), and agriculture 1.32% (6/454), and income of less than 5,000 Baht/month (7.23%, 22/304) Table 1. Socio-demographic characteristics of the participants and IHIs were computed the different in each variable using Chi-square test and found that there were no a significant different between the prevalence of intestinal helminthes and each characteristics (Table 1). IHIs were identified as *O. viverrini* 1.26% (2/454) and followed by *A. lumbricoides* 0.39% (2/454), *S. stercoralis* 0.19%(1/454), and *Taenia spp.* 0.19%(1/454), respectively. Socio-demographic characteristics associated with IHIs were analyzed using multivariate analysis, are shown in Table 2. No significant association was found between IHIs and participants' gender, level of age, education, job status, and location (*P* >0.05).

Table 1. Positive rate of intestinal helminthic eggs categorized by general characteristics

Variables	No. Samples n(%)	No. positive n(%)	Infection rate (%)	Chi-square	P-value
Gender					
Male	158(34.80)	4(2.53)	0.88	0.905	0.014
Female	296(63.87)	2(0.67)	0.44		
Age (yr)				5.836	0.559
21-30	16(3.52)	0(0)	0		
31-40	59(12.99)	3(5.08)	0.66		
41-50	144(31.72)	2(1.39)	0.44		
51-60	155(33.25)	1(0.64)	0.22		
61-70	71(15.64)	0(0)	0		
71-80	9(1.98)	0(0)	0		
Education				4.180	0.382
Illiterate	2(0.44)	0(0)	0		
Primary	341(75.11)	3(0.88)	0.66		
Secondary	93(20.48)	1(1.07)	0.22		
Diploma	7(1.54)	1(14.28)	0.22		
Academic	11(2.42)	1(9.09)	0.22		
Job Status				2.315	0.382
Famer	331(72.91)	4(1.20)	0.88		
Employed	80(17.62)	1(1.25)	0.22		
Trade	18(3.96)	0(0)	0		
Housewife	15(3.30)	0(0)	0		
Government officer	6(1.32)	1(16.67)	0.22		
Other	4(0.88)	0(0)	0		
Location (District)				1.385	0.239
Nong Bua Sa-At	208(45.81)	3(1.44)	0.66		
Khun Thong	246(54.18)	3(1.22)	0.66		

Table 2. Factors associated to intestinal helminthic infection using multivariate logistic regression analysis

Variables	No. Samples n(%)	No. positive n(%)	Infection rate (%)	OR (95%CI)	P-value
Gender Male	158(34.80)	4(2.53)	0.88	1.066 (0.377-3.011)	0.905
Female	296(63.87)	2(0.67)	0.44		
Age (yr) 21-30	16(3.52)	0(0)	0	0.920(0.576-1.470)	0.559
31-40	59(12.99)	3(5.08)	0.66		
41-50	144(31.72)	2(1.39)	0.44		
51-60	155(33.25)	1(0.64)	0.22		
61-70	71(15.64)	0(0)	0		
71-80	9(1.98)	0(0)	0		
Education Illiterate	2(0.44)	0(0)	0	1.422(0.737-2.744)	0.382
Primary	341(75.11)	3(0.88)	0.66		
Secondary	93(20.48)	1(1.07)	0.22		
Diploma	7(1.54)	1(14.28)	0.22		
Academic	11(2.42)	1(9.09)	0.22		
Job Status Famer	331(72.91)	4(1.20)	0.88	1.043(0.548-10987)	0.804
Employed	80(17.62)	1(1.25)	0.22		
Trade	18(3.96)	0(0)	0		
Housewife	15(3.30)	0(0)	0		
Government officer	6(1.32)	1(16.67)	0.22		
Other	4(0.88)	0(0)	0		
Location Nong Bua Sa-At	208(45.81)	3(1.44)	0.66	0.279 (0.029-2.702)	0.239
Khun Thong	246(54.18)	3(1.22)	0.66		

Discussions

IHIs are important public health problems in tropical countries. Unlike in developed countries where efficient control, urbanization and other socioeconomic factors have created better conditions for the decline in prevalence of IHIs, these infections still continue to be a major health problem in the third world countries particularly STHs have been recognized as important public health problems in many developing countries^{10,11}. The public health problems caused by IHIs have been neglected in rural areas of Thailand where there remains a lack of hygiene and an inadequate supply of sanitary water¹². Surveillance and epidemiological survey in the rural community using the rapid, reliable, and safe detection tool of intestinal parasites is needed. MPFC is used for isolating and identifying helminth's eggs and larvae, and protozoal cysts. The organisms eventually present without altering their morphological characteristics, concurring also to an easy acknowledgment of the same through microscope observation. The filter concentrator tube is a newer modification of the closed concentration system, which can easily be adopted in any routine microbiology laboratory⁵⁻⁸. Presently, the overall prevalence of IHIs among the entire tested participant group who live in rural communities using MPFC was 1.32%. These results was compared to other study and found that recent infection rate of these study were lower than previous reported among gardeners who were studied in Nakhon Ratchasima province⁴, Khon Kaen¹³, Chachoengsao province¹⁴. This result indicates that the successful of decreased infection rate is under control and elimination is possible through the prevention and control campaign from Ministry of Public Health in collaborated with network teams in each areas during last 5 years periods¹⁵⁻¹⁷. Our study demonstrated that gender showed a significant association between the prevalence of intestinal helminthes. The infection rate was higher in males than in females. The gender difference may be due to male-specific behavioral factors¹³ such as the alcohol drinking with colleagues, eating raw meat, and taking risks with their work in the farm¹². In our study, the prevalence of IHIs in middle age group was higher than in young and old people. This result is similarly to previous studies that middle aged people is needed to screen for IHIs^{4,12}. This may be because older people still have poorer education, live in conditions of poor sanitation, and the culturally embedded habit of eating

uncooked food¹⁸. The infection rate is frequently found in the participants who are the agriculture and education level in primary school. This is similar to previous studies indicate that people in the community have a low level of education, and these people have a relatively high prevalence of parasites^{10,12}. The agriculture may be taking risks with their work in the farm¹². Health education programs should target this group and teach them about the benefits of wearing shoes, and the risky eating habits. Four species of intestinal helminthes were identified; two species were identified as STHs and the other two species were FBHs. However, the presence of STHs and FBHs was not significantly different with infection rate. FBHs also were identified as *O. viverrini* and *Taenia spp.* that concerning about *O. viverrini*, the carcinogenic liver fluke and serious problem in Thailand. Our data showed that *O. viverrini* infection is the highest prevalence in these participants (1.26%) but it was lower than previously studies in that near areas. Kaewpitoon et al¹⁹ reported that *O. viverrini* infection among a Thai rural population from Nakhon Ratchasima, Khonkaen, and Chaiyaphum provinces was found to be 2.86%. Kaewpitoon et al⁴ also reported that *O. viverrini* infection was found in people in the border areas of three provinces, northeastern Thailand included Kaeng Sanam Nang district of Nakhon Ratchasima province, Waeng Noi district of Khon Kaen province, and Khon Sawan district of Chaiyaphum province, Thailand. In addition, of 209 faecal samples have been surveyed in the rural areas of Nakhon Ratchasiam province, Thailand and found that *Taenia spp.* infection was 0.48%²⁰. These result indicates that people still have the culturally embedded habit of eating uncooked meat and poorer education. Findings from our study demonstrated that the most prevalent STHs found in human feces was *S. stercoralis* (0.19%), which were also the common prevalent nematode in the Thailand study of previous studies^{3,4,12,14}. These study showed that *S. stercoralis* infection is more prevalent than other types of STH infection. This STH has a direct life cycle and the main route of exposure is contact with larvae contaminated soil due to lack of footwear²¹. Other STH with significant prevalence was *A. lumbricoides*. Therefore, preventive measures should be taken to improve the health of the people against such helminths. These results indicate that *O. viverrini* is still a problem in Thailand that these liver fluke still exists and raises

concerns regarding public health.

Conclusion

In conclusion, our results show concentration method is useful in the epidemiological survey, increase in the yield of parasites, processing time and cost. A prevalence rate of IHs among adult age groups living in the rural communities. These infections result mainly from food borne helminthes and skin-penetrating nematode. Therefore, focus on intervention should concentrate on personal hygiene of the population and improving the sanitation to reduce IHs in this area.

Ethical Clearance: This study was approved by the Ethics Committee for Research Involving Human Subjects of Suranaree University of Technology, Thailand (EC- 59-38).

Source of Funding: The present study was supported by the National Research Council of Thailand (NRCT), fiscal year 2018, and the SUT research and development fund, Suranaree University of Technology (SUT), Thailand.

Conflict of Interest: The authors declare that they have no conflicts of interest.

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Tinnitus Profile in Dr. Soetomo Hospital, Surabaya

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Abstract

Background: Approximately 10-15% of the world's population has tinnitus with or without concomitant hearing loss. This study aimed to determine the profile of tinnitus patients in the outpatient unit Neurotology Division Dr. Soetomo hospital. **Methods:** This study was a retrospective descriptive study and conducted by taking data from medical records. **Result:** Total there were 420 samples were taken from medical records from January 2016 to December 2018. Ratio male and female patient was 3:1. The most patients were male as many 315 patients (75%). The highest age group of tinnitus patients in the age group of 31-40 years were 232 patients (55.2%). Non-tinnitus complaints were 286 patients (68%). Complaints of unilateral tinnitus were 398 patients (94.7%). Tinnitus complaints with hearing loss as many as 384 patients (91.4%). The most hearing loss types in sensorineural type were 191 patients (49.8%). The highest degree of hearing loss in the moderate hearing loss group was 277 patients (66%). Tinnitus patients with the most comorbidities were CSOM in 98 patients (34.3%).

Conclusion: Profile of tinnitus patients mostly men, the age group 31-40 years, the main complaints of non-tinnitus, unilateral, sensorineural type hearing loss, with the degree of moderate hearing loss and concomitant chronic suppurative otitis media.

Keywords: Tinnitus, Hearing loss, Profile

Introduction

Tinnitus was a common problem for millions of the world's population. About 10-15% of the world's population has tinnitus with or without hearing loss. Research in India reports that 4.5 million Indians had been diagnosed with tinnitus.² Epidemiological studies from the National Health and Nutrition Examination Survey (NHANES) in the United States report that up to 25.3% of the United States population has tinnitus and this data was confirmed by a study in Korea The National Health and Nutrition Examination Survey (KNHANES) reported that as many as 10,000 to 12,000 populations

in South Korea are affected by tinnitus. Data from the United Kingdom national study of hearing states the prevalence of tinnitus patients was 15.8% of the total UK population.^{3,4}

Patient visit data to the Outpatient unit of Otorhinolaryngology-Head Neck Cipto mangunkusumo hospital from June 2008 to June 2009 found 256 cases of tinnitus with various etiological backgrounds.¹ The incidence of tinnitus in the outpatient unit of Neurotology Otorhinolaryngology-Head Neck Dr. Soetomo hospital Surabaya had been not yet found completely recorded. Complaints in the form of ringing in the ears ringing are experienced by many patients who visit audiology clinics, both as the main complaint or with accompanying complaints.

Tinnitus can be divided into objective tinnitus and subjective tinnitus. It is defined that objective tinnitus if the sound can also be heard by the examiner and said subjective tinnitus if tinnitus can only be heard by the

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patients. Objective tinnitus is very rare, on the contrary, subjective tinnitus is most commonly found in the practice of daily life.^{4,5} Tinnitus can be associated with increased stress, depression, a history of stroke, angina and better living conditions. Can also be associated with problems of hearing loss, tympanic membrane perforation, and balance problems.³⁻⁵

In tinnitus, there was an electrical activity in the auditory area that causes a feeling of sound, but the impulses that come not from an external sound that is transformed, but from the source of abnormal impulses in the patient's own body. Abnormal impulses can be caused by various ear disorders and tinnitus can occur in various intensities.⁶⁻⁸

This study aimed to determine the profile of tinnitus patients in the Neurotology Outpatient Unit of Otorhinolaryngology-Head Neck Surgery Departement, Dr. Soetomo Hospital Surabaya in the January 2016 to December 2018.

Method

This study was a retrospective descriptive study and conducted by taking data from medical records of activities in the Division of Neurotology and medical records of patients. The study population was all patients who came to the audiology clinic with complaints of tinnitus. The inclusion criteria were patients with medical records who had audiogram records and were diagnosed as tinnitus. Exclusion criteria were medical records of patients without an audiogram. The results collected in the form of gender, age, complaints based on the side of the ear, type of hearing loss, degree of hearing loss, complaints with or without comorbidities and comorbidities with complaints of tinnitus. All records are taken from the patient's medical record, then recorded in the data collection sheet and then tabulated data. Data processing will be tabulated and presented descriptively then presented in tabular and narrative form.

Results

There were 420 samples were taken from medical records. Within a period of 3 years, 420 samples of patients with symptoms of tinnitus were obtained from January 2016 to December 2018. Distribution data were described as gender, age, complaints based on the side

of the ear, type of hearing loss, degree of hearing loss, complaints with or without comorbidities and comorbid disease tinnitus complaints. The recording of age is based on patient data during the patient's first visit to the outpatient unit of Otorhinolaryngology-Head Neck, Division of Neurotology of Dr. Soetomo Hospital Surabaya.

Table 1. Characteristic of subject CRS

Variable	N (%)	Total
Sex		
Male	315 (75%)	420 (100%)
Female	105 (25%)	
Age		
<10	0 (0.0%)	420 (100%)
11-20	4 (0.9%)	
21-30	70 (16.7%)	
31-40	232 (55.2%)	
41-50	48 (11.4%)	
51-60	38 (9.1%)	
61-70	22 (5.3%)	
>70	6 (1.4%)	

Table 1 shows that there were 420 tinnitus patients with 315 male patients (75%), while 105 female patients (25%). The highest age group of tinnitus patients in the age group of 31-40 years was 232 patients (55.2%), followed by the age group 21-30 years with 70 patients (16.7%), followed by the age group of 41-50 years. 48 patients (11.4%), followed by the age group 51-60 years as many as 38 patients (9.1%), then followed by the age group 61-70 years as many as 22 patients (5.3%), followed by the age group > 70 years 6 patients (1.4%) and 11-20 years age group 4 patients (0.9%) showed the least tinnitus patients. The youngest age when diagnosed with tinnitus is found at the age of 15 years and the oldest age is found at the age of 74 years.

Table 2. Characteristic of Main complaints and

side of the ear patient

Main complaints	N (%)	Total
Tinnitus	134 (32%)	420 (100%)
Non tinnitus	286 (68%)	
Side of the ear		
Unilateral	398 (94.8%)	420 (100%)
Bilateral	22 (5.2%)	

Based table 2 There were 134 tinnitus complaints as the main complaints (32%) and 286 non-tinnitus complaints (68%) and there were 398 patients (94.8%) unilateral tinnitus complaints and 22 patients (5.2%) bilaterally.

Table 3. Distribution of Tinnitus and Hearing Loss

Variable	N (%)	Total
Tinnitus Complaints		
Normal	36 (8.6%)	420 (100%)
With hearing loss	384 (91.4%)	
Degree of hearing loss		
Normal	36 (8.6%)	420 (100%)
Mild	41 (9.7%)	
Moderate	277 (66%)	
Severe	34 (8.1%)	
Profound	32 (7.6%)	
Types of Hearing Loss		
Conductive type	159 (41.4%)	384 (100%)
Type Sensorineural	191 (49.8%)	
Type Mixed	34 (8.8%)	

In Table 3, There were 36 complaints of tinnitus without hearing loss (8.6%) and 384 patients of hearing loss with tinnitus (91.4%). The most common type of

hearing loss in sensorineural type was 191 patients (49.8%), followed by conductive type in 159 patients (41.4%) and the least mixed type in 34 patients (8.8%). The highest degree of hearing loss in the moderate hearing loss group of 277 patients (66%), followed by mild hearing loss in 41 patients (9.7%), followed by normal hearing in 36 patients (8.6%), followed by severe hearing loss in 34 patients (8.1%), and at least in profound hearing loss, 32 patients (7.6%).

Table 4. Distribution of with comorbidities

Tinnitus with comorbidities	N (%)	Total
Acute otitis media	86 (30.0%)	420 (100%)
Chronic Suppurative Otitis Media	98 (34.3%)	
Benign paroxysmal position vertigo	67 (23.4%)	
After a traffic accident	29 (10.2%)	
Presbycusis	6 (2.1%)	
Tinnitus without comorbidities	134 (32%)	

Based table 4. It was found that patients tinnitus without comorbidities as many as 134 patients (32%). The most comorbidities are chronic suppurative otitis media (CSOM) in 98 patients (34.3%), then acute otitis media (AOM) in 86 patients (30%), then benign paroxysmal positional vertigo (BPPV) in 67 patients (23.4%), then after the traffic accident with 29 patients (10.2%) and the least in presbycusis concomitant diseases were 6 patients (2.1%).

Discussion

The ratio of tinnitus patients to men compared to women in this study was 3: 1. These results are consistent with research in the Department of ENT University Medical Center Groningen in the Netherlands that says men patients more tinnitus than women 68% vs 38%.² These results are also consistent with research conducted

in southern India with the result that more males patients tinnitus with 58.4% compared to 41.6%.² The high number of male patients can be caused by higher sound exposure experienced by men than women.

Based on age, the results of this study were divided into 8 groups and the most age distribution of tinnitus patients in the age group of 31-40 years was 232 patients or 55.2%, the results of the age distribution in this study were by following research conducted on the Korean population in 2014 with the most age group is 30-39 years old and followed in the 40-49 year age group.³ These results can be caused by environmental and noise exposure which can result in damage to the conduction and sensory system of the ear.

Previous research performed in India between 2004-2014 obtained results complaint unilateral tinnitus more than bilateral. Complaints of unilateral tinnitus were found in 1917 patients (58.9%) and bilateral in 1338 patients (41.1%).² The results of the above study are strengthened by the results of research conducted at the Department of Otorhinolaryngology- Head Neck Surgery, Faculty of Medicine, Diponegoro University Semarang / RSUP Dr.Kariadi in 2015, the results of complaints of unilateral tinnitus were more dominant with 25 patients and bilateral with 4 patients.⁴ Results of the study are consistent with this retrospective study. In this retrospective study, there were 398 unilateral tinnitus complaints (94.7%) and bilateral complaints with 22 patients (5.3%).

Tinnitus a significant complaint for the patients. Tinnitus complaints can be identified early with hearing loss and often with concomitant diseases such as *Meniere in sease*, *sudden SNHL*, chronic suppurative otitis media, acute suppurative otitis media, otosclerosis and presbycusis.² In a study in South India in 2004-2014 it was said that chronic suppurative otitis media was a dominant comorbid disease with 184 patients, followed by effusion otitis media with 19 patients and presbycusis in 18 patients.^{2,4} This is consistent with the results of research that the majority of concomitant diseases of tinnitus are chronic suppurative otitis media and acute otitis media.

The results in this retrospective study found the highest sensoryneural deafness hearing loss with a total of 191 patients (45.4%), followed by conductive

hearing loss with 169 patients (40.2%). In previous research data that conductive deafness is the dominant type of hearing loss in 2254 patients, sensorineural deaf 540 patients and 317 mixed deaf patients.^{2,3} This study was supported by research from India in 2015 that result of hearing loss conductive hearing loss 46.51%, 43.02% and the type of sensorineural deafness intervened as much as 10.47%.⁹ In this study compared to previous studies found incompatibility, but the results were not too significant.

Tinnitus and hearing loss are two things that are very closely related, and the prevalence of hearing loss is higher than tinnitus. Previous studies found that 96.9% of cases with tinnitus were related to hearing loss and this indicated one of the crucial risk factors.^{2,10} In several studies found tinnitus was closely related to conduction type hearing loss than sensorineural types, such as examples of otitis media, otosclerosis and presbycusis.^{2-4,9}

Conflict of Interest: The authors have no conflicts of interest.

Ethical Clearance : This study was received ethical approval from the Health Research Ethics Committee Dr. Soetomo Hospital Surabaya.

Sources of Funding: This study was supported by the authors

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Routine Cleaning of Poultry Cages as a Determinant of Underweight among Children Aged 6-59 Months in Indonesia

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Abstract

Objective: This study examined whether there is a significant relationship between routine cleaning of poultry cages and the incidence of underweight in children aged 6-59 months in Indonesia. Raising poultry has a significant relationship with the incidence of recurrent infections. Families who keep poultry have greater incidence of fevers and colds. This is a concern when the management of the poultry cage is poor, as the presence of poultry in the environment is one of the causes of recurrent infectious diseases with symptoms of cold or fever, and has a significant relationship with underweight.

Method: This cross sectional study in Babakan Madang Subdistrict with participants of 612 mother and children under five, and 298 of them have poultry. Interviewing respondents using questionnaire and poultry management observations. Anthropometric measurements in children under five are weight and height. *Descriptive* analysis and the relationship of independent variables with the incidence of underweight using *chi-square* for bivariate analysis.

Results: 10.8% of children aged 6-59 months were underweight. Significant relationships were found between underweight status and routine cage cleaning ($p = 0.017$; OR 3.205; 90%CI:1,268-8,101); family income ($p = 0.050$; OR 1,728; 90% CI:1,033-2,892); recurrent fever ($p = 0.046$; OR 1,763; 90% CI:1,042-2981); and recurrent colds ($p = 0.003$; OR 2,259; 90%CI: 1,348-3,784).

Conclusion: Routine cleaning of poultry cages at least once per day is the key to maintaining environmental cleanliness so that the poultry that are kept do not cause infectious diseases that lead to underweight among children.

Keywords: *underweight, children, poultry, infectious disease.*

Introduction

Environmental factors such as access to clean water, sanitation and hygiene, including maintaining poultry, especially chickens that live freely and roam the environment where children live, play an important role. Several previous studies have shown that sex, diarrhea, acute respiratory infections, growth monitoring, completeness of immunization, management of cages and raising poultry are all related to the nutritional status of children, and specifically to whether they are underweight [1,2,3,4,5].

Based on health data in Bogor Regency (2015), 16,291 cases of diarrhea and gastroenteritis in children 6-59 month (10.8%), 12,086 cases of skin disease

and sub-cutaneous skin issues in children 6-59 month (7.54%), and high prevalence of ARI in children 6-59 month, at 79,004 cases (49.29%) [6]. Some of these cases are thought to be due to sources of environmental pollution through air and water that results from the unsafe disposal of household waste, accumulation of livestock manure, and residents' hygiene, as well as poor environmental sanitation of residents' homes [7].

Infectious diseases that often affect children under five include flu, scabies, which can cause itchy rashes, fever, diarrhea, and toxoplasma, which can inhibit fetal growth [8].

Materials and Method

1. Participants

This research was a team-based study with a cross-sectional observational design. Research locations encompassed a working area of six selected villages (Kadumanggu, Babakan Madang, Cipambuan, Sumur Batu, Cijayanti, and Karang Tengah) in Babakan Madang Subdistrict with a sample of 612 mother and children under five and 298 of them have poultry cages. Babakan Madang subdistrict is part of the Bogor Regency in the province of West Java, Indonesia. Consecutive recruitment of mother and Children inclusion criteria of the sample were: mother and children aged 6-59 months who lived and settled for at least one year in the study area.

While the exclusion criteria for toddlers are as follows: Toddlers who experience mental disorders, physical disabilities and congenital diseases (1); If there are two toddlers in one family, then the youngest toddler is used as a research sample (2); Twin babies in the family are not taken (3).

2. Data collection

The minimum sample size was calculated using the hypothesis test for two populations and obtained $N = 612$, and collecting the responden using purposive sampling with minimum 100 respondent in every villages. The dependent variable in this study was underweight as an indicator of nutritional status. The independent variables were family income, personal hygiene, environmental sanitation, and poultry maintenance management. Data collections was carried out by trained enumerators who divided into 2 teams lead by 1 field coordinator, and consist by 12 enumerators.

First step we collecting the anthropometry measurements were children's weight and height. Public health community service as a place to measure anthropometrics collected in one day, with data collection techniques taken from all respondents of mothers and children under five years who came. From one village consists of 3-4 community health service. Each community health service consists of 25-30 respondents. Second step in this study was conducted by interviewing respondents using the 2018 basic health research (Risksdas 2018) questionnaire. Information

was also collected regarding observations of the presence of poultry cages with reference to poultry rearing management in residential neighborhoods in 2006.

The independent variables were children's characteristics: age (1); body weight (2); and height (3). Family characteristics were defined through the level of family income. Sanitation was assessed in terms of how household waste was handled. The independent variables were personal hygiene, through the habit of mothers washing their hands with soap and running water (1) and cutting their nails at least once per week (2). The existence of poultry and its relation to environmental sanitation was assessed through: raising poultry (1); number of poultry owned (2); distance of the cage from the residents' house (3); distance of the cage from the source of drinking water (3); routine cleaning of cages (4); handling of dead poultry (5); handling of garbage and manure (6).

3. Measurement and statistical analysis,

Anthropometric measurements in children under five are weight and height. The weight of children aged 24-59 months using a digital scale using the "Tanita" brand with accuracy up to two digits behind the comma. Height measurements using microtoa with the GEA brand. Measuring the weight of toddlers aged 6-23 months using baby scales and digital height using the "onemed" with accuracy up to 2 digits behind the comma.

Results

(Z-scores) were calculated using *WHO-Anthro*; Z-score results were then grouped, with < -2.00 being classified as underweight and ≥ -1.999 as non-underweight. Observation of the distance of the cage with related variables (drink water resources and children household) was measured using the *GPS-Essentials* application and in meters, with distances of 0-3 meters being categorized as posing risks to the health and nutritional status of children under five and distances of > 3 meters as posing no risk. Statistical analysis used is IBM SPSS statistics 20 with a license from Public Health Faculty Universitas Indonesia, with *descriptive* analysis and the relationship of independent variables with the incidence of underweight using *chi-square* for bivariate analysis. Values were deemed to be

statistically significant when $p < 0.1$

Results

Univariate and bivariate analysis were carried out for each variable, both independent and dependent. The analysis obtained the following results in Descriptive statistics for age and children anthropometric measurement (Table 1) and The relationship of independent variables with the incidence of underweight (Table 2).

Participants were typically aged 16-48 years old for mother with average 29,32 (6,34) years, and children 6-59 month and the mean 29,32 (15,56) month. Mean children height 82,7cm (11,36); and children weight is 11,16 kg (2,98) (Table 1).

Independent variable by connecting the above variables to the incidence of underweight as the dependent variable. More than half of the participants (64,8%) had an income equal to or greater than the regional minimum wage of West Java Province (\geq IDR 3,760,000). Family income has a significant relationship with the incidence of underweight, with a p-value of 0.1 ($p=0.05$). The results of the chi-square analysis for the recurrent disease were as follows. Recurrent fever ($p = 0.046$); recurrent colds: ($p = 0.003$). The presence of poultry and its relation to environmental sanitation were also found to be significant, routine cleaning of cage ($p = 0.017$); household waste disposal ($p = 0.099$). The relationship between routine (weekly) nail cutting habits and the risk of underweight in children was also shown to be significant ($p = 0.067$) (Table 2).

Table 1. Descriptive statistics for age and children antropometric measurement.

Variabel	n	%	Mean (SD)	Min - Max
Age of mother	610	99.7	29.32 (6.34)	16-48
Age of Children	612	100	27.54 (15.56)	6-59
Children weight	612	100	11,16 (2.98)	4,80 – 25,10
Children height	612	100	82.7 (11.36)	50,30-115,0
Children weight according to height	612	100	-0,08 (0,065)	-4,83-6,69
Children weight according to age	612	100	-0,86 (0,06)	-5,07 – 3,81

Table 2. The relationship of independent variables with the incidence of underweight

Variable	Normal		Underweight		Total		P 90%CI	OR
	%	n	%	n	%	n		
BB/U (Z-score)	89.2	546	10.8	66	100	612		
Family income \geq Rp. 3.760.000,- < Rp. 3.760.000,-	91.1 85.6	359 543	8.9 14.4	35 66	100 100	394 215	0,05** (1.033-2.892)	1,728
Recurring fever Yes No	84.9 90.8	152 387	15.1 9.2	27 39	100 100	179 426	0.046** (1.042-2.981)	1.763

Cont... Table 2. The relationship of independent variables with the incidence of underweight

Variable	Normal		Underweight		Total		P 90%CI	OR
	%	n	%	n	%	n		
Recurring colds								
Yes	83.9	187	16.1	36	100	223	0.003** (1.348-3.784)	2.259
No	92.1	352	7.9	30	100	382		
Recurring coughs								
Yes	86.3	363	9.5	38	100	401	0.148 (0.93-2.557)	1.520
No	90.5	176	13.7	28	100	204		
Have poultry								
Yes	90.5	268	9.5	30	100	298	0.475 (0.742-2.121)	1.255
No	88.4	266	11.6	35	100	301		
The number of poultry owned								
1-20	88.4	130	11.6	17	100	147	0.512 (0.337-1.542)	0.720
>20	91.4	138	8.6	13	100	151		
Distance from the cage to the house								
>3 meter	94.1	20	5.9	1	100	17	1 (0.231-14.14)	1.806
0-3 meter	89.9	248	10.1	33	100	281		
Distance from the cage to drinking water source								
>3 meter	92.1	105	7.9	9	100	114	0.391 (0.684-3.517)	1.551
0-3 meter	88.3	158	11.7	21	100	179		
Routine cleaning of poultry cage								
Good (1x/day)	95.1	117	4.9	6	100	123	0.017** (1.268-8.101)	3.205
Poor	85.9	146	14.1	24	100	170		
Handling of dead poultry								
Good (burned or buried)	89.6	250	10.4	29	100	279	1 (0.861-0.933)	0.896
Poor (dumped into the river / trash)	100	1	0	0	100	1		
Handling of garbage and manure								
Good (separate from household)	89.4	186	10.6	22	100	208	0.673 (0.308-1.825)	0.749
Poor (combined with household)	91.9	79	8.1	7	100	86		
Household waste disposal								
Good	90.4	424	9.6	45	100	469	0.099** (0.953-2.901)	1.663
Poor	85.0	119	15.0	21	100	140		
Hand-washing habits								
Good	88.2	254	11.8	34	100	288	0.550 (0.496-1.379)	0.827
Poor	90.0	289	10.0	32	100	321		
Nail-cutting habits								
Good	91.6	315	8.4	29	100	344	0.067** (0.998-2.850)	1.686
Poor	86.6	219	13.4	34	100	253		

**Variable significant ($p < 0.1$)

Discussion

Routine cleaning of the cage at least once per day is the key to maintaining environmental cleanliness, have a protective effect against underweight, reducing the incidence by a factor of three. The poultry that are kept do not cause infectious diseases that lead children to become underweight. This is in line with several studies [8].

Another important factor is the poultry disposal and livestock manure separately from household waste and in closed containers. Most of the respondents in this study disposed of their enclosure waste and their household waste together in open rubbish sites. Household waste disposal was significantly associated with children being underweight. Previous research has demonstrated that [9].

It is known that recurrent fevers and colds are one of the determinants of underweight status in children (table 2). There is a relationship between the maintenance of poultry and pathogens in children, affecting the health and the nutritional status of children under five, leading them to become underweight. This is related to the routines of poultry owners in terms of whether they maintain the cleanliness of the cage with routine cleaning at least once per day, the distance of the cage from the house, and the distance of the cage from the household drink water source. This is also in line with previous research [10].

Environmental factors such as household drink water sources, sanitation and hygiene, with particular attention focused on roaming chickens, given the proximity to children in rural areas, were a concern in this study related to the nutritional status of children living in the environment. There is a risk that communicable diseases or environmental enteric dysfunction can occur due to exposure to livestock droppings, causing recurrent infections in children living in that environment [11,12,13,14,15].

Raising poultry has a significant relationship with the incidence of recurrent infections. Children who maintain poultry have increased incidence of recurrent fever and colds. This is a concern related to poor cage management, and the presence of poultry in the neighborhood is one of the causes of such recurrent infectious diseases and has a

significant relationship with underweight.

In line with prior research [2], this study showed that the habit of mother for cutting children's nails at least once per week was significantly associated with underweight in children. Pathogens from poultry are generally transmitted through poor environmental sanitation, polluted water sources, and hand and nail hygiene.

The description of the relationship of infectious diseases in children under five who have poultry at home compared to those who do not was also a concern in this study. From the results in Tables 1 and 2, It can be seen that households with routine cleaning a caged poultry a significant relationship with underweight. Most of those who maintain poultry are families with an income of less than 3.7 million rupiah/month. In line with these results [1,8,13]. It is necessary to provide understanding and increase knowledge in families who maintain poultry, to encourage them to set aside some of their poultry products to be consumed by the family, especially their children [16,17,18,2].

Conclusion

Routine cleaning of poultry cages at least once per day is the key to maintaining environmental cleanliness. So that the poultry that are kept do not cause infectious diseases that lead to underweight among children.

Acknowledgment: Mentored and directed by Mrs. Dr. Ir. Trini Sudiarti MSi as a supervisor in providing input into the research substance. In addition, Prof. Dr. dra. Ratu Ayu Dewi Sartika Apt, MSc in assisting author for determining the research methodology.

Declarations

Funding: This research was funded by Universitas Indonesia Directorate of Research and Community Service in 2019.

Conflict of interest: No potential conflict of interest are reported.

Ethical approval: Approved by the Research and Community Engagement Ethical Committee, Faculty of Public Health, Universitas Indonesia (number 257/UN2.F10/PPM.00.02/2019).

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Effect of Schistosomiasis Control Program Performance on Schistosomiasis Incidence Rate in Sigi Regency, Central Sulawesi, Indonesia

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Abstract

Schistosomiasis is a zoonotic disease based on transmission transmission classified in the metazoonosis group. Based on data from the Central Sulawesi Provincial Health Office on the prevalence of schistosomiasis cases, it shows that schistosomiasis cases continue to increase from year to year to above the WHO standard of 1%. The purpose of this study was to determine the effect of schistosomiasis control program performance on the incidence of schistosomiasis in Sigi Regency, Central Sulawesi, Indonesia. This research was an observational study with cross sectional design. The sample size was 122 people. The results showed that the factors that influenced the incidence of schistosomiasis were the IEC of Officers while the treatment program did not directly influence the incidence of schistosomiasis. Recommendations to improve the performance of schistosomiasis control programs include making regular outreach programs where puskesmas staff provide IEC about schistosomiasis in the community. Providing space for puskesmas to make special programs related to the control of schistosomiasis which so far have been centralized in the Sigi District Health Office. Coordinate with related parties such as the Department of Hygiene and Green Open Space to create a snail eradication program as a vector of Schistosomiasis disease.

Keywords: *Schistosomiasis, Performance, Control, Prevalence*

Introduction

Schistosomiasis is a zoonotic disease based on transmission classified in the metazoonosis group. Metazoonosis is a zoonosis with a transmission cycle that requires vertebrates and involves invertebrates to perfect the life cycle of disease-causing agents. Schistosomiasis is an obligatory metazoonosis in which humans or vertebrates must be one of the hosts in their life cycle.¹

In infected cases, an estimated 120 billion people show symptoms of schistosomiasis, and 20 billion people have serious complications. In 2011 reported by WHO, there were 243 million people requiring treatment for schistosomiasis, with the number of people reported having been treated for schistosomiasis in 2011 of 28.1 million.²

Schistosomiasis control programs have been very widely implemented and applied by the international and

national world. But until now the program has not found a bright spot related to the resolution of schistosomiasis cases. Schistosomiasis is endemic in 76 low income countries, namely in rural and suburban areas. More than 700 million people worldwide are at risk of infection, with more than 207 million people infected with schistosomiasis, 85% of whom live in Africa.³

This disease control activity has existed since 1982. At the beginning of the activity focused on human activities, namely the treatment of the population. It is also supported by counseling activities, procurement of environmental health facilities, examination of population feces, inspection of snails of transmitters and rats on a regular and regular basis.^{4,5}

Schistosomiasis in Indonesia is only found in Central Sulawesi Province. This case is found in 2 regencies / cities in Central Sulawesi which are endemic areas, namely Sigi Regency and Poso Regency. Sigi Regency

precisely in Lindu Valley and Poso Regency precisely in Napu Valley, Besoa Valley and Bada Valley.^{6,7}

Data from the last 3 years released by the Central Sulawesi Provincial Health Office on the prevalence of schistosomiasis cases shows that schistosomiasis cases continue to increase from year to year to above the WHO standard of 1%. This is closely related to schistosomiasis control programs in Central Sulawesi.^{8,9}

The prevalence of schistosomiasis in 2014-2016 has increased, the lowest prevalence in 2014 was 1.66%, and the highest prevalence in 2016 was 1.86%.⁶ There are two areas that are endemic to schistosomiasis cases, namely Lengkeka, Poso Regency and Lindu, Sigi Regency. The following is case data and prevalence in both districts. The prevalence of Poso Regency from 2014 to 2016 has decreased. Whereas in Sigi Regency the prevalence of schistosomiasis has increased and is still above the national target (<1%). Therefore, this study is focused in Sigi Regency because the prevalence of cases is still quite large and has increased, where the condition is not in accordance with the target of schistosomiasis treatment programs. The purpose of this study was to determine the effect of schistosomiasis control program performance on the incidence of schistosomiasis in Sigi

Regency, Central Sulawesi, Indonesia.

Research Methods

Research using cross sectional design. The study was conducted in the working area of the Lindu Community Health Center. Data collection and processing will be conducted from April to May 2019.^{10,11} The population in this study is the entire community in the area of Lindu Health Center, Sigi Regency, Central Sulawesi (2579 people). The sample in this study were residents with a history of schistosomiasis and residents who had never experienced schistosomiasis. The sample size for the community analysis unit was 122 people. The community as a research sample will be interviewed regarding the schistosomiasis control program that has been conducted by Lindu Community Health Center staff.^{12,13} Variables that will be examined include the IEC officer, the stability of the treatment program in the working area of the Lindu Community Health Center, and also the incidence of schistosomiasis in the community. IEC officers and treatment programs are indicators of the performance of schistosomiasis control programs in the work area of the Lindu Community Health Center, Sigi Regency, Central Sulawesi, Indonesia.^{14,15,16}

Result

Table 1 Identification of Officer IEC

Statement	Score							
	(1)		(2)		(3)		(4)	
	n	%	n	%	n	%	N	%
Have received information about Schistosomiasis from Puskesmas staff	9	7,4	11	9,0	45	36,9	57	46,7
Motivated to take medication when experiencing schistosomiasis by officers	10	8,2	21	17,2	43	35,2	48	39,3
Obtain information about the mode of transmission of schistosomiasis from officers	25	20,5	31	25,4	32	26,2	34	27,9
Obtain information about symptoms of schistosomiasis from officers	11	9,0	27	22,1	54	44,3	30	24,6

Cont Table 1 Identification of Officer IEC

Statement	Score							
	(1)		(2)		(3)		(4)	
	n	%	n	%	n	%	N	%
Getting information about the source of schistosomiasis transmission from the officer	17	13,9	25	20,5	25	20,5	55	45,1
It is recommended by officers to use footwear and hand protection when working	18	14,8	20	16,4	44	36,1	40	32,8
It is recommended by officers to defecate defecation	21	17,2	20	16,4	41	33,6	40	32,8
Average	15,9	13,0	22,1	18,1	40,6	33,3	43,4	35,6

Most of the respondents considered that the puskesmas staff had conducted IEC, as evidenced from around 69% of respondents who answered that they often and always did IEC to the community related to schistosomiasis. This means that basically IEC officers are already good, but it needs to be improved in IEC related information about the way of transmitting schistosomiasis because there are still more than 40% included in the category of IEC poor officers with rare and never criteria.

Table 2 Identification of Treatment Programs

Statements	Score			
	(1)		(2)	
	n	%	N	%
know that there is always treatment at the Puskesmas for Schistosomiasis sufferers	7	5,7	115	94,3
always get treatment when coming to the health center when experiencing schistosomiasis	5	4,1	117	95,9
Average	6	4,9	116	95,1

It shows that the majority of respondents considered that the treatment program at the puskesmas was always available (94.3%) and always received treatment (95.9%). This means that the majority of respondents assume that the treatment program has been running and is routine.

Table 3 Effect of Schistosomiasis Control Program Performance on the Occurrence of Schistosomiasis

Indicator	Occurrence of Schistosomiasis				Total		P	Exp (B)
	Yes		No					
	N	%	n	%	n	%		
1. Officer IEC							0,000	17,944
a. Poor	34	89,5	4	10,5	38	100,0		
b. Good	27	32,1	57	67,9	84	100,0		
2. Treatments Program							0,411	-
a. Poor	4	66,7	2	33,3	6	100,0		
b. Good	57	49,1	59	50,9	116	100,0		

From the table it can be seen that the direct effect on the incidence of schistosomiasis is the IEC of officers ($p = 0,000$ and $\text{exp (B)} = 17,944$) while the treatment program does not affect the incidence of schistosomiasis. This means that officials need maximum efforts to carry out IEC on the community so that the incidence of schistosomiasis can be reduced.

Discussion and Conclusions

The implementation of the Schistosomiasis Disease Control Program in Sigi Regency which aims to reduce the prevalence of Schistosomiasis to below 1% requires several roles including the role of related agencies that have been appointed to move in an integrated team to control Schistosomiasis.^{17,18} The role of the Schistosomiasis laboratory which serves as the discovery of sufferers, the discovery of habitat from snails and treatment of patients with Schistosomiasis, the role of the Lindu Community Health Center in increasing knowledge and changes in community behavior and the participation of the community itself, in this discussion is the community of the Lindu Community Health Center.^{19,20}

The government in implementing infectious disease prevention programs can form work units / implementing units. Based on the prevalence / incidence of illness and characteristics of infectious diseases, the target of communicable disease control programs can be through elimination. Elimination is an effort to reduce the disease on an ongoing basis in certain regions so

that the disease morbidity rate can be reduced as low as possible so that it does not become a health problem in the area concerned.

Based on the results of the study, it is known that the majority of IEC officers are good, as is the treatment at the puskesmas where the majority of the community knows that there is treatment for schistosomiasis at the puskesmas and the majority of the population receives the treatment at the puskesmas.²¹

Efforts to find cases of schistosomiasis require active participation from the community. Public awareness to check themselves into the health center is crucial to the discovery of schistosomiasis cases. The active role of cadres in helping Puskesmas to report schistosomiasis is urgently needed. The low participation of the community and cadres can hamper the discovery of cases of schistosomiasis. This is due to the busyness of the community itself and minimal community knowledge related to the case of schistosomiasis which must be resolved by maintaining the health of the community itself.²²

The discovery of the case of schistosomiasis requires strong motivation from health workers, where officers have a strong desire and feel attached to their organizations so that they voluntarily and try hard to achieve organizational goals. In line with this, researchers also found that there were still unprofessional health workers working on the program because the incentives obtained were still far from expectations.

Make regular outreach programs where puskesmas staff provide IEC about schistosomiasis in the community. IEC is very important because IEC officers influence community factors and environmental factors, also directly affect the incidence of schistosomiasis. From this IEC, it is expected to increase public knowledge, especially in the context of improving environmental conditions so that people do not get too much exposure to the vector of schistosomiasis.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication.

Ethical Clearance: This research has been approved by the Health Research Ethics Committee Faculty of Nursing Universitas Airlangga with Ethical Approval Number: 1767-KEPK published in 9th September 2019.

Source of Funding: This research was funded by self funding.

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A Cross-Sectional Study to Evaluate the Association of Body Mass Index with Oral Health Status

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Abstract

Purpose of the study: To evaluate the association between BMI and oral health status, along with the frequency of tooth brushing and frequency of food intake.

Methods: This study was conducted at outpatient clinic, for adults who had visited to the dental clinic. The decayed, missing, and filled teeth (DMFT) index and Periodontal Disease Index (PDI) were used to determine the prevalence of dental caries and periodontitis respectively. Multiple linear regression analysis was used to determine the association between age, BMI, frequency of tooth brushing and food intake with DMFT and PDI.

Results: A total of 100 subjects were enrolled with a mean age of 33 years. Of the 100 subjects, 10% were underweight, 56% were normal, 25% were overweight and 9% were obese upon BMI calculation. There was a positive correlation between age versus PDI and age versus DMFT and this correlation was found to be statistically significant ($p=0.00$). There is a negative correlation of BMI, frequency of food intake and tooth brushing with PDI and positive correlation with DMFT was noticed. The multiple linear regression analysis showed that age and frequency of tooth brushing was influencing PDI and DMFT significantly.

Conclusions: A negative correlation between the PDI and BMI but positive correlation with DMFT and BMI was observed. Longitudinal studies with a larger sample size are required to confirm the association of body mass index and periodontal disease and dental caries.

Keywords: *Body mass index, DMFT, frequency of food intake, PDI, tooth brushing.*

Introduction

Obesity is defined as a condition of abnormal and excessive fat accumulation in adipose tissue to the extent that health may be adversely affected.¹ According to the World Health Organization (WHO), it is the fifth leading cause of mortality worldwide and risk factor for many diseases such as type 2 diabetes, hypertension

and certain types of cancers. However, it is generally acknowledged that most of the patients diagnosed with non-communicable diseases are obese.² Body Mass Index is the most common way of measuring obesity and it represents the weight levels; associated with the lowest overall risk to health and is an indicator of overall adipose tissue. There are other ways as well, to measure the obesity which includes waist circumference, waist to hip ratio and total body fat.³ A low BMI is easily explainable on the basis of being real functional difficulties there that can prevent normal eating in some cases. On the other hand, the association of poor oral health with obesity is likely to be associated with the quality of the diet.⁴ There are studies which have pointed out an association

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between oral conditions and BMI and concluded that increased BMI had slightly worse dental health.^{3,5,6} The present study is aimed to assess the relationship between oral health status represented DMFT and PDI, and BMI among healthy adults. Literature search reveals only few studies comparing the relation of BMI and oral health status has been carried out in the Malaysian population to our knowledge. So, the aim of the present study is to assess the association between BMI and oral health status (dental caries and periodontal status), along with the frequency of tooth brushing and frequency of food intake.

Materials and Methods

The present study was conducted in AIMST Dental Institute, AIMST University, Kedah, Malaysia. A total sample size of 100 subjects with equal number of males and females were chosen with the mean age of 33 years. Patients with any systemic disease(s) with under medication or undergoing any therapy and pregnant patients were excluded from the study. Informed written consent was obtained from all respondents and they were asked to respond to all statements completely and voluntarily. Patient's age, gender, height (*in cm*), weight (*in kg*), frequency of food intake and frequency of tooth brushing were recorded by the examiner.

Oral examination was performed by a single examiner for the assessment of dental status (dental caries, missing teeth and restored teeth) and periodontal status. The periodontal status and dental status were assessed using Periodontal Disease Index (PDI) and DMFT Index respectively.

After recording the required data from the patients, BMI was calculated using formula weight in (kg) divided by square of height in (m).

Based on the BMI values, all patients were categorized as underweight, normal weight, overweight and obese patients as Group A, B, C and D, as <18.5 kg/m², 18.5 to 24.9 kg/m², 25 to 29.9 kg/m² and <30 kg/m² respectively.

All the data were tabulated and analysed using the Statistical Package for Social Science Software, version 22.0 (SPSS, Chicago, IL, USA). Frequency analysis was

done for categorical variables and descriptive statistical measures were calculated for continuous variables. One way analysis of variance (ANOVA) was used to compare the different groups of BMI, frequency of food intake and tooth brushing with PDI and DMFT followed by Duncan's Multiple Post Hoc Test. The parametric Pearson correlation was used to analyse the continuous variables and non parametric Spearman's (rho) correlation was performed for ordinal and continuous variables. Multiple linear regression analysis was performed to determine the degree of prediction of PDI and DMFT with age, BMI, frequency of food intake and tooth brushing.

Results

Of the 100 subjects, 10% were underweight, 56% were normal, 25% were overweight and 9% were obese upon BMI calculation. Frequency of tooth brushing of once, twice or more than twice a day were reported as 23 %, 55% and 21% respectively as well as for frequency of food intake 45% reported thrice daily followed by 26% and 18% for four to five times respectively.

The frequency, mean and standard error for BMI, frequency of food intake and tooth brushing in relation with PDI and DMFT are depicted in **Table 1**. Pearson correlation (r) analysis of the continuous variables such as age versus PDI and age versus DMFT is shown in **Table 2**. It is observed that there is a positive correlation between the age versus PDI and age versus DMFT, with p value 0.00. It means that as the age increases, there is an increase in PDI and DMFT. Spearman's rho correlation analysis of the ordinal and continuous variables such as age, BMI, frequency of food intake and tooth brush with PDI and DMFT is shown in **Table 3**. The linear regression analysis results for age versus PDI and DMFT are presented in **Table 4** and **Graph A**. The coefficient of determination R² was found to be (0.175) and the slope was 0.051 with PDI. The coefficient of determination R² was found to be (0.268) and the slope was 0.253 with DMFT. The multiple linear regression analysis results for the independent variables (BMI, Frequency of food intake and frequency of tooth brushing and dependent variable (PDI and DMFT) are presented in **Table 5**.

		n	PDI		DMFT	
			Mean ± SE	p value*	Mean ± SE	p value*
BMI	Underweight (Group A)	10	0.73±0.20	0.102	7.90 ±1.78	0.696
	Normal (Group B)	56	1.26±0.15		8.28 ±0.74	
	Over weight (Group C)	25	1.83±0.34		9.12±0.75	
	Obese (Group D)	9	1.40±0.31		10.11±1.58	
Frequency of food intake	2 times a day	8	1.46±0.46	0.890	8.0±2.15	0.569
	3 times a day	45	1.49±0.20		9.5±0.78	
	4 times a day	26	1.18±0.17		7.5±0.85	
	5 times a day	18	1.26±0.34		8.16±1.21	
	6 times a day	3	1.46±0.74		9.33±3.48	
Frequency of tooth brushing	once a day	24	1.96±0.27	0.005	7.8± 0.61	0.428
	twice a day	55	1.34±0.16		8.54± 0.70	
	> twice a day	21	0.73±0.21		9.76± 1.41	

*One way ANOVA test; $p < 0.05$ considered significant

Table 1: Frequency, mean and standard error for BMI, frequency of food intake and tooth brushing in relation with PDI and DMFT

	Age versus PDI	Age versus DMFT
<i>r</i>	.419**	.518**
p value	.000	.000

Pearson correlation (*r*); $p < 0.05$ considered significant.

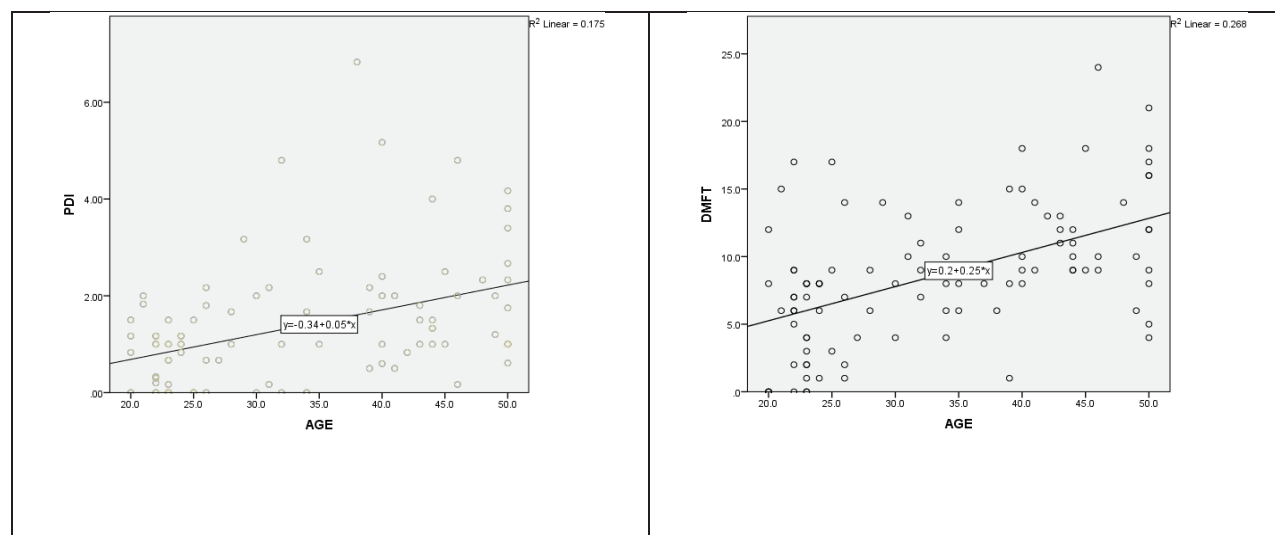
Table 2: Pearson correlation (*r*) analysis of the continuous variables such as age versus PDI and age versus DMFT

Variables	Periodontal Disease Index (PDI)		Decayed, Missing, Filled Teeth Index (DMFT)	
	Spearman's rho "r"	p value	Spearman's rho "r"	p value
Age	0.445	0.000	0.523	0.000
BMI	-0.144	0.154	0.137	0.173
Frequency of food intake	-0.078	0.440	-0.074	0.463
Frequency of tooth brushing	-0.383	0.000	0.113	0.264

Table 3: The relationship between age, BMI, frequency of food intake and tooth brush with PDI and DMFT.

	PDI			p value	DMFT			p value
	Slope 'B'	Correlation coefficient 'r'	Coefficient of determination R2		Slope 'B'	Correlation coefficient 'r'	Coefficient of determination R2	
Age	0.051	0.419	0.175	0.00	0.253	0.518	0.268	0.00

Table 4: Linear regression analysis for age versus PDI and DMFT



Graph A: Scatter plot showing the linear relationship between the age versus PDI and the age versus DMFT

Table 5: Multiple regression analysis of age, BMI, frequency of food intake and tooth brushing with PDI and DMFT.

Independent variables	PDI				DMFT			
	Slope 'B'	p value	Correlation coefficient 'r'	Coefficient of determination R2	Slope 'B'	p value	Correlation coefficient 'r'	Coefficient of determination R2
Age	0.046	0.00	0.506	0.256	0.259	0.00	.550	0.302
BMI	0.086	0.572			0.163	0.781		
Frequency of food intake	0.00	0.998			0.012	0.979		
Frequency of tooth brushing	0.514	0.003			1.419	0.033		

Discussion

Obesity is a growing health-related problem worldwide. Both obesity and oral health are important issues with multifactorial aspects. The prevalence of adult with elevated BMI in Malaysian population was found to be about one in two adults, while one in five were obese.⁷ Prevalence and severity of caries and periodontitis are significantly affected by several factors including age, educational backgrounds, socioeconomic status, genetic susceptibility, fluoride percentage in drinking water, and level of dental awareness.^{8,9} Association between BMI and oral health has been ascribed to unhealthy dietary patterns with insufficient micro-nutrients and excess sugar and fat content¹⁰ and in older adults with poor perception of oral health were more likely to have unsatisfactory BMI.¹¹

The objectives of the present study were to determine the effect of frequency of tooth brushing and frequency of food intake on oral health and its association with BMI and to correlate the findings of periodontal status, dental status, the effect of frequency of tooth brushing and frequency of food intake on oral health status with BMI.

The severity of dental caries ranges greatly from less than 5 to more than 20 (DMFT index).¹² In the present study as depicted in Table 5, statistically significantly and multiple regression model showed positive correlation of DMFT with the age of the population which is in agreement with the study conducted by Abbass MMS et al¹³ in 2019 who stated that DMFT increases significantly with increase in age. It is observed that statistically non-significant with positive correlation was found between BMI and DMFT which is in accordance with findings by Sheiham et al⁴ in 2002, who showed that British people that had less than 20 teeth were more likely to be obese; however, a study performed on Riyadh adults by Idrees M et al¹⁴, in 2017 and Abbass MMS et al¹³ in 2019 on Egyptian population revealed an inverse correlation but, age significantly influenced the DMFT index.

The type and frequency of food habits also play one of the important role in health or disease of a population. Evidence from the previous studies reveals a positive correlation between caries incidence and sugar intake in children and in adults, the present investigation reported statistically non-significant with negative correlation

between frequency of food intake and DMFT. This could be due to the limitation of present study where type of food has not been taken into consideration and with limited sample size. This could explain the lack of significant differences among the different group of BMI and DMFT in association with frequency of food intake. But positive correlation among tooth brushing and DMFT was reported which in agreement with the study by Abbass MMS et al¹² in 2019.

It is well known that being older than 35 years is considered a risk factor for tooth loss as a result of periodontal diseases.¹⁵ Therefore, to exclude any external age-related factors that might influence the oral health status negatively of study subjects, our study subjects were limited to adults aged 35 years and younger.

In the current study, as depicted in Table 5, PDI was found to be statistically significant and multiple regression model showed positive correlation with the age of the population which is in accordance with the study conducted by Lopez R, Smith PC et al⁸ in 2017 and PDI with frequency of tooth brushing which is also in accordance with the systemic review study by Lertpimonchai A et al¹⁶ in 2017. And also Han K et al¹⁷ stated in his study among Korean adults, that tooth brushing post lunch and before bedtime as well as the use of floss and a powered toothbrush may be considered independent risk indicators of periodontal disease. BMI and frequency of food intake was found to be non-significant however, type of food intake has showed a significant reduction in periodontal diseases reported by Woelber JP et al¹⁸ in 2017 but frequency of food intake has not yet reported as per our search and knowledge. The higher prevalence of periodontal disease among the present study population can be attributed to a multitude of reasons like poor oral hygiene practices, poor living conditions and low access to dental health services.

Conclusion

A negative correlation between the PDI and BMI and positive correlation with DMFT and BMI was observed. Their association is still questionable as other factors like age, frequency of food intake and tooth brushing have varied influence may be because of not considering the type of food, social habits and mode of tooth brushing in the present study. Longitudinal studies with a larger sample size are required to confirm the

association of body mass index and oral health status.

Conflict of Interest: Nil

Source of Funding: Self-funded

Ethical Clearance: Ethical clearance is obtained from the AIMST University ethical clearance committee

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A Study on Stress, Self-Perception and Resilience among Undergraduate Nursing Students

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Abstract

Background: The aim of this study was to identify the levels of stress, self-perception and resilience of undergraduate nursing students and to recognize the correlations between them.

Method: The research design is a descriptive correlational study design which used convenience sampling on 198 senior nursing students in South Korea. The used research measures were tools which measure stress, self-perception and resilience. Data collection was conducted from May 13, 2019 to May 24, 2019 using SPSS 21.0 for data analysis.

Findings: The results show that stress is affected by health status, and clinical practice satisfaction. Meanwhile, resilience is affected by health status, interpersonal relationships, personality trait and major satisfaction. Stress and resilience are negatively correlated while self-perception and resilience are positively correlated. Furthermore, an increase in self-perception correlates with an increase in resilience and a decrease in self-perception correlates with a decrease in resilience.

Applications: It is important for nursing leaders of education and practice to find out the sources of stress and coping strategies used by the students so that such leaders can help students effectively manage upcoming problems and situations. In addition, if the social support system that protects nursing students is systemically formed and utilized, it can not only help increase self-perception and resilience of prospective helping professionals but also improve their happiness.

Keywords: *Nursing, Stress, Self-perception, Resilience.*

Introduction

Stress in nursing education is acknowledged as one of the most important issues in in this rapidly changing society. Stress may have an impact on the physio-psychosocial health of the nursing students. During nursing education and training, students experience various stressors which may directly or indirectly impede their learning and clinical performance^[1].

High levels of stress are believed to affect student's psychophysical health and academic functions^[2]. When stress is magnified by factors such as academic, interpersonal, and emotional relationships, it can result in physical and physiological symptoms along with dissatisfaction and maladjustment in college life^[3]. The emotional and physical ways in which we respond to pressure can cause mental and physical symptoms^[4].

The WHO estimated that stress-related disorders will be one of the leading causes of disability by the year 2020. Compared to other students, nursing students bear the burden of balancing both heavy academic studies and clinical practice^[5]. Therefore, it is important to seek for a solution and look into industrial-educational cooperation to cope with nursing students' stress in this modern rapidly changing health care reality.

Nursing students who engage in clinical practice experience more stress compared to other students because they not only have to go through rigorous academics but also as half a member of society must acquire a specific set of information from clinical practice in a short period of time^[6]. If these stresses are not adequately addressed, they will not only negatively affect physical health but may also bring out depression, anxiety, reduced confidence, academic degradation,

and school maladjustment^[7]. Despite being aware that clinical practice is essential, nursing students are afraid of losing confidence and some may even feel conflicted about their major.

There have been many studies on control variables that are thought to either buffer the effects of stress or help students adapt to stress. These studies found out that self-perception and self-efficacy were the control variables^[8]. Self-perception is an important factor in college life and adjustment. Nursing students with high self-perception are found to be satisfied with their major and as a result of low stress levels and response factors from clinical practice, they act confidently and communicate with patients smoothly and energetically^[9]. Seo reported that self-perception was the most influential factor in the clinical performance of nursing college students^[10]. The higher the self-perception was the lower the stress of clinical practice and the higher the major satisfaction. Thus, those with high self-perception have a greater tendency to try out new behaviors and possess high self-efficacy and academic achievement^[11].

Resilience is a concept derived from the point of view that it can buffer or help the adaptation of extreme stress. While there are precedent studies which focus on nursing students' stress from clinical practice and from academic and career problems, there is a lack of study on stress that stems from general university life and clinical practice performance^[12]. In addition, self-efficacy and resilience have been studied as individual factors that predict college life adaptation, but there has been little study that testifies the possibility of self-esteem as an intermedator between academic stress and college adjustment^[13]. Most of the precedent studies aimed its focus on clinical practice, conducting surveys on only self-esteem and practice satisfaction^[14]. Therefore, this study was to identify the levels of stress, self-perception, and resilience of undergraduate nursing students and to recognize the correlations between them.

Method

This study's participants were senior students who are currently enrolled in a nursing college in G city and have had more than 1 year of experience in clinical practice. The appropriate number of participants for this study was calculated, based on significance level (α) .05, effect size .30, power .95 when using G* power 3.1

program^[15]. The final number of participants was 198.

In order to measure the stress of nursing students, the study used a tool of Yoo et al^[16] which was developed to measure the stress of nursing students in South Korea. The self-perception profile tool used the one that Neemann and Harter's^[17] developed for college students, which Eun^[18] modified. To measure the resilience, the study used a version of the Resilience Scale(RS) developed by Wagnild and Young^[19].

Data collection took place from May 13 to May 24, 2019 and focused on senior students who were attending school at the nursing college in South Korea. Before data collection, a self-reporting type questionnaire was used to explain questionnaire contents and writing methods and to receive students' consent to participate in this study.

The participants were informed of the study's necessity, purpose, and method beforehand in order to protect their rights. The research was conducted only after participants voluntarily gave their written consent.

The collected data used SPSS/win 21.0 Program. The differences between stress, self-perception and resilience according to the participants' general characteristics were analyzed by t-test, one-way ANOVA. The correlations between stress, self-perception and resilience of the participants were analyzed by Pearson's correlation coefficient.

Results

1. General Characteristics of the participants

The general characteristics of the participants are as follows [Table 1].

2. Differences between stress, self-perception and resilience according to the participants' general characteristics

Stress according to the participants' general characteristics of health status($F=4.759$, $p=.001$), and clinical practice satisfaction($F=3.856$, $p=.000$) presented statistically significant differences. Self-perception according to all of the general characteristics presented no statistically significant differences as well. Resilience according to the participants' general characteristics of health status($F=6.021$, $p=.001$), interpersonal

relationships ($F=5.189$, $p=.001$), personality ($F=9.021$, $p=.000$) and major satisfaction ($F=9.102$, $p=.001$) presented statistically significant differences. The differences in stress, self-perception and resilience according to the participants' general characteristics are as follows [Table 2].

3. Correlations between stress, self-perception and resilience

The relationship between stress and resilience

was a negative correlation ($r=-.261$, $p=000$). In other words, as stress increases, resilience decreases and as stress decreases, resilience increases. Meanwhile, self-perception and resilience was found to be a positive correlation ($r=.165$, $p=.023$). Thus, as self-perception increases, resilience increases and as self-perception decreases, resilience decreases. The correlations between stress, self-perception and resilience of the participants are as follows [Table 3].

Table 1. General Characteristics of the participants

Characteristics		n	%
Gender	Male	26	13.1
	Female	172	86.9
Health status	Poor	8	4.0
	Neutral	92	46.5
	Healthy	98	49.5
Academic achievement	Low	9	4.5
	Middle	150	75.8
	High	39	19.7
Inter-personal relationship	Poor	2	1.0
	Neural	103	52.0
	Good	93	47.0
Personality	Introverted	102	51.5
	Extroverted	96	48.5
Major satisfaction	Unsatisfied	13	6.6
	Neutral	60	30.3
	Satisfied	125	63.1
Clinical practice satisfaction	Unsatisfied	30	15.1
	Neutral	90	45.5
	Satisfied	78	39.4

Table 2. Differences between stress, self-perception and resilience according to the participants' general characteristics (n=198)

Variable	Categories	Stress	Self-perception	Resilience
		M±SD t/F(p)	M±SD t/F(p)	M±SD t/F(p)
Gender	Male	2.76±1.01 .046	3.85±0.26 .054	5.01±0.61 0785
	Female	2.87±0.54 (.849)	3.91±0.24 (.846)	4.88±0.51 (.301)
Health status	Poor	3.42±0.57	3.79±0.43	4.20±0.37
	Neutral	2.93±0.49 4.759	3.92±0.31 1.036	4.51±0.62 6.021
	Healthy	2.87±1.01 (.001)	3.87±0.25 (.287)	5.01±0.61 (.001)
Academic achievement	Low	2.94±0.78 .668	3.72±0.43 1.893	4.84±0.56 5.621
	Middle	2.39±0.41 (.502)	3.84±0.29 (.128)	4.77±0.52 (.731)
	High	3.05±0.51	3.80±0.03	5.01±0.65
Inter-personal relationship	Poor	3.05±0.04 2.051	3.94±0.02 1.982	4.88±0.02 5.189
	Neutral	3.04±0.74 (.079)	3.81±0.32 (.106)	4.89±0.58 (.001)
	Good	2.79±0.57	3.49±0.21	5.31±0.62
Personality	Introverted	3.51±0.06 3.012	3.89±0.24 2.012	4.25±0.31 9.021
	Extroverted	3.85±0.54 (.052)	3.86±0.25 (.288)	5.04±0.41 (.000)
Major satisfaction	Unsatisfied	3.08±0.03 2.463	3.58±0.21 1.056	4.41±0.27 9.102
	Neutral	3.54±0.49 (.036)	3.91±0.33 (.288)	4.99±0.61 (.001)
	Satisfied	3.01±0.59	3.92±0.34	5.08±0.71
Clinical practice satisfaction	Unsatisfied	3.64±0.25 3.856	3.85±0.24 .416	4.97±0.41 2.215
	Neutral	2.98±0.59 (.000)	3.76±0.24 (.649)	4.88±0.59 (.051)
	Satisfied	2.88±0.59	3.57±0.24	5.34±0.5.

Table 3. Correlations between stress, self-esteem and resilience (n=198)

Variables	Stress	Self-perception	Resilience
Stress	1	.112(.135)	-.261(.000)
Self-perception	.112(.135)	1	.165(.023)
Resilience	-.261(.000)	.165(.023)	1

Discussion

The purpose of this study was to identify the levels of and relations between stress, self-perception, and resilience of undergraduate nursing students. Also, the study attempted to provide basic data that will help others seek a direction in decreasing the stress levels of nursing students and help them adapt to college life. The study's results found that there were significant differences in stress according to health status, major satisfaction, and clinical practice satisfaction. Also, there were significant differences in resilience according to health status, interpersonal relationship, personality, and major satisfaction. The significant correlation between stress and resilience was found to be a negative correlation and a positive correlation for self-perception and resilience. In other words, as stress increases, resilience decreases and conversely, as stress decreases, resilience increases. For self-perception and resilience, an increase in self-perception resulted in an increase in resilience and conversely, a decrease in self-perception resulted in a decrease in resilience.

There was a statistically significant difference in stress according to the participants' general characteristics of health status, major satisfaction and clinical practice satisfaction. In terms of gender, the stress for male college nursing students was 2.76 and 2.87 for female nursing students, indicating that stress was not dependent on gender. In terms of health status, a poor health status scored a lower score in stress while a good health status scored a higher score, indicating a sequential relationship. Chow et al reported similarly in his study that a nursing student's academic stress affected health status^[12].

Students in the high academic achievement group showed the highest tendency for stress while students in the middle group presented the lowest level of stress, indicating an inconsistent tendency among different scholastic achievements. Thus, the differences were not statistically significant. Students with a higher level of interpersonal relationship had a tendency to experience less stress. Also, students who were more satisfied with their major demonstrated a lower tendency for stress.

In this study, stress related to clinical practice especially decreased as clinical practice satisfaction increased. Stress was 3.64 for the unsatisfied group, while the average decreased to 2.88 for the satisfied group. The results of this study suggest that a sufficient consultation between the practical institution and the school should be required, focusing on how an increase in clinical practice satisfaction can help reduce clinical practice stress. Also, there is a need to explore a variety of directions, such as pre-clinical practice mentoring, in order to help students cope with clinical practice stress.

The descriptive statistics of self-perception according to general characteristics showed that there was a difference between academic achievement groups. Self-perception tended to increase more according to academic achievement. Lee reported in a study similar to this study that self-perception has a direct effect on learning immersion and an indirect effect on academic achievement^[11]. There is a slight increase of self-perception from unsatisfactory major to satisfactory major satisfaction but it is not statistically significant. However, the study was able to grasp that a higher major satisfaction leads to a positive direction in self-perception, which raises the importance of increasing major satisfaction.

Resilience according to the general characteristics of the study's participants showed statistically significant differences in health status, interpersonal relationships, personality, and major satisfaction. According to health status, the unhealthy group scored 4.20 points while the healthy group sequentially scored higher with 5.01 points. Therefore, since health status is an important variable in increasing resilience, it is necessary to plan and manage an appropriate health program for these students.

Resilience also demonstrated differences according to interpersonal relationships. The average interpersonal relationships group scored 4.89 points. The considerable influence of interpersonal relationships on students' resilience raises the need for an appropriate mediation. Resilience according to personality showed differences as well with the introverted group scoring 4.25 points and the extroverted group 5.04 points. Therefore, freshmen students should take personality type tests like MBTI in the beginning of the term so schools can use those results to host appropriate programs that can help out introverted students or those with narrow interpersonal relationships^[20]. Resilience according to major satisfaction also showed that students with a higher major satisfaction tended to be more positively resilient.

The analysis of the correlation between stress, self-perception, and resilience reveals that an increase in stress levels correlates with a decrease in resilience. Conversely, a decrease in stress levels correlates with an increase in resilience. An important attribute of resilience is the process when one returns to everyday life after a difficult situation, so there is a great need to manage various resilience improvement programs in order to help alleviate the stress of nursing students.

The correlation between stress and self-perception did not satisfy a statistically significant level. This study found that resilience of nursing students increases as self-perception increases and vice versa. Efforts to enhance the image of the nursing profession will result in improved job satisfaction, which is linked to better quality of care and improved health outcomes.

Conclusion

The significance of this study is that first, it examines

the experiences of nursing students who engage in clinical practice in this rapidly changing healthcare environment. The study evaluates the stress students experience from college life or clinical practice and provides an analysis of its relationship with variables. Secondly, it provides basic data for nursing colleges on how to efficiently lead and manage students. Thirdly, this study is of significance in the aspects of research, education, and practice in that it provides industrial institutions in charge of clinical practice for nursing students with basic data on how to efficiently manage nursing students. Therefore, there is a need for interest and strategy in improving the quality of life for prospective helping professionals who will play an important role in the future.

Conflicts of Interest: None

Source of Funding: Self

Ethical Clearance: Taken from CNCR committee

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Does Drinking Water Sources, Knowledge and Hygiene Behavior of Mother Influence the Quality of Drinking Water for Toddlers?

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Abstract

Background : Clean water is one of the vital needs for human. The low availability of clean water has a bad impact on all sectors, including health. Around 3,800 children die every day due to diseases related to unhygienic drinking water access. Cholera, ringworm, diarrhea, or typhus are a small number of diseases that may arise from consuming unhygienic water. Even unsafe drinking water, poor sanitation, and hygiene behavior contribute to 88% of child deaths due to diarrhea worldwide¹. According to World Health Organization data, nearly 1.7 billion cases of diarrhea occur in children and kill around 525,000 children under five every year in the world². While in Indonesia, there was an outbreak of diarrhea in 2018 with the number of children under five as sufferers as many as 1,637,708 (40.90%). One of cities that has the highest diarrhea cases in Indonesia is Depok, more specifically in Tapos Sub-district with 1,274 diarrhea cases³. Diarrhea in toddlers is closely related to the quality of drinking water consumed and maternal care factors. This study aims to determine whether maternal hygiene knowledge and behaviors affect the quality of toddler drinking water.

Method : This study was an observational with cross sectional design. This research used questioner and the sample are mothers who have toddler who consume drinking water in Tapos Sub-district, Depok, in period of November to December 2019. The quality of drinking water is known through measurements of *Total Coliform* and *Escherichia coli*. The data analysis using *Chi-square* test.

Result: The respondents are 100 samples, there are 62 families using groundwater (62.0%) and 38 families using refill drinking water as a drinking water sources. The results of bivariate analysis between drinking water sources and drinking water quality is 0.247 (OR 0.458-34.284), knowledge of mother and drinking water quality is 1.000 ($p>0.05$), while hygiene behavior of mother and drinking water quality is 0.594 ($p>0.05$).

Conclusion: None of drinking water sources, knowledge and hygiene behavior of mother influence the quality of drinking water for toddlers.

Keywords: Hygiene knowledge, Hygiene behavior, Mother, Drinking water, Diarrhea, Toddler

Introduction

Water is a natural resource that has a very important function in life, both in terms of quality and quantity.

Most of human body (60%-80%) consists of water, so if there is a lack of fluids, then a person will become dehydrated or attacked by other diseases⁴. But the problem today is quality of drinking water in big cities in Indonesia still being a concern. The government has regulated the requirements for drinking water quality inside Minister of Health Regulation No. 492/Menkes/PER/IV/2010. It explains that drinking water must be free of inorganic and organic materials. Drinking

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water quality parameters are directly related to health, i.e. related to microbiology, like *Total Coliform* and *Escherichia coli*⁵.

The results of Indonesia Basic Health Research in 2010 showed that the highest percentage of clean water facilities used for domestic use are dug well water (27.9%), drilled wells (24.7%), tap water (14.2%), and deep well/pump (14%). Rationally, 90% of the physical quality of drinking water in Indonesia is included in good category. However, there are still households with poor drinking water quality, characterized by turbid water (6.9%), color (4.0%), flavorful (3.4%), foamy (1.2%) and smelly (2.7%)⁶. Poor water quality can affect health, especially in toddlers. One of them is a risk of suffering from diarrhea. In 2018, West Java Province, specifically in Depok, was recorded as one of the provinces experiencing outbreaks of diarrhea and the Sub-district which has the highest diarrhea cases was Tapos (1,274 cases)⁷. Several studies have shown a significant relationship between poor drinking water quality and the incidence of diarrhea. One study conducted in fifty villages from all villages in Bangladesh that showed a positive relationship between *Escherichia coli* contamination in drinking water with the incidence of diarrhea in toddlers with PR = 1.26 (95% CI 1.00- 160)⁸. Toddlers drinking water quality is influenced by several factors including drinking water sources, knowledge and hygiene behavior of mother of proper drinking water treatment.

Based on an initial survey in Tapos Sub-district, Depok, data were obtained that most of toddler mothers were under the age of 25 years and their final education did not reach senior high school. So based on this background, researchers are interested in finding out whether there is a relationship between water sources, knowledge and hygiene behavior of mother with the quality of drinking water for toddlers in Tapos Sub-district, Depok.

Methods

The research method was used cross sectional. The population consisted of 72,388 households and the samples are 100 mothers who have toddlers who consume drinking water in Tapos Sub-district, Depok, in the period of November to December 2019. Tapos Sub-district has 7 villages, that is Tapos, Leuwinanggung, Sukamaju Baru, Cilangkap, Jatijajar, Sukatani, and Cimpaeun. Sampling in each villages was calculated using the Slovin formula so that 6 samples were obtained in Tapos, 22 samples in Leuwinanggung, 12 samples in Sukamaju Baru, 19 samples in Cilangkap, 12 samples in Jatijajar, 17 samples in Sukatani, and 12 samples in Cimpaeun and were conducted in simple random sampling.

The knowledge of respondent was considered good if it gets a value ≥ 70 in the questionnaire given. While the hygiene behavior of respondent was considered good if they always boiled water for drinking and kept it in clean and closed containers. The quality of drinking water is known through measurements of *Total Coliform* and *Escherichia coli* in Indonesian University Public Health Laboratory using the Most Probable Number (MPN) method. The exclusion criteria from this research were heads of families who have toddlers who only consume breast milk (do not consume drinking water). The data analysis using *Chi-square* test.

Results

Univariate Analysis

Distribution of Respondents According to The Source of Drinking Water Used

The distribution of respondents who used drinking water sources came from ground water was 62 respondents (62%), while 38 others (38%) used drinking water sources from refilled drinking water. In meeting the eligibility standards for consumption, more than 90% (93%) of drinking water in Tapos Sub-district, Depok, was declared ineligible after undergoing laboratory testing.

Table 1. Distribution of Respondents According to The Source of Drinking Water Used and The Status of Drinking Water in Meeting Eligibility Requirements for Consumption

Drinking Water Resource	Frequency	Percentage (%)	Status of Quality / Not Quality				Total	
			Qualify		Not Qualify		n	%
			n	%	n	%		
Ground water	62	62	6	9.7	56	90.3	62	100
Refill Drinking Water	38	38	1	2.6	37	97.4	38	100
Total	100	100						

Distribution of Respondents According to Hygiene Knowledge and Hygiene Behavior

Hygiene knowledge in this research is about the requirements for proper drinking water, also the good and the right way to process and store drinking water, so it will be free from pathogenic bacteria and safe to drink by toddlers. While hygiene behavior was a habit of mother to cook drinking water that will be consumed by toddlers and storing it in a clean and closed containers.

Table 2. Distribution of Respondents According to Hygiene Knowledge and Hygiene Behavior

The Variables	Frequency	Percentage (%)	Total
The Knowledge of Respondents about Hygiene			
Good knowledge	96	96	100
Poor Knowledge	4	4	
Hygiene Behavior of Respondents			
Good Hygiene Behavior	84	84	100
Poor Hygiene Behavior	16	16	

Based on table 2, the distribution of hygiene knowledge most of the respondents was good. Respondents who have good hygiene knowledge were 96 people (96%), while 4 other respondents (4%) have a poor hygiene knowledge. Then the distribution of respondents who have implemented good hygiene behavior was 84 respondents (84%), while 16 other respondents (16%) haven't implemented.

Bivariate Analysis

Cross-tabulation results of the relationship between drinking water sources, hygiene knowledge and hygiene behavior of mother and the quality of drinking water for toddlers are shown in table 4.

Table 4. Cross-tabulation of The Relationship Between Drinking Water Sources, Hygiene Knowledge, and Hygiene Behavior of Mother and Drinking Water Quality For Toddlers in Tapos Sub-district, Depok

The Variables	Drinking Water Quality				Total		OR	P
	Based on Measurement of <i>Total Coliform</i> and <i>Escherichia coli</i>							
	Qualify		Not Qualify		n	%	(95% CI)	Value
n	%	n	%					
Drinking Water Resource								
Ground Water	6	9.7	56	90.3	62	100	3.964	0.247
Refill Drinking Water	1	2.6	37	97.4	38	100	0.458-34.284	
Hygiene Knowledge of Mother								
Good Hygiene Knowledge	7	7.3	89	92.7	96	100		1
Poor Hygiene Knowledge	0	0	4	100	4	100		
Hygiene Behavior of Mother								
Good Hygiene Behavior	7	8.3	77	91.7	84	100		0.594
Poor Hygiene Behavior	0	0	16	16	16	100		

Table 4 shows the analysis result of the relationship between drinking water sources and the quality of drinking water for toddlers. There was only 6 respondents (9.7%) who used ground water and met the requirements for drinking water quality that was suitable for toddlers. While respondents who used refill drinking water sources and met the requirements was 1 respondent (2.6%). Chi-square test results obtained p value = 0.247 and OR = 3.964, it can be concluded that there is no significant relationship between drinking water sources and drinking water quality for toddlers.

The analysis result of the relationship between maternal hygiene knowledge and drinking water quality for toddlers found that there were 7 respondents (7.3%) who had good hygiene knowledge and qualify for drinking water quality for toddlers. While the respondents who have poor knowledge and had qualify drinking water quality for toddlers are none. Chi-square test results obtained $p = 1$, it can be concluded that there is no significant relationship between maternal hygiene knowledge and drinking water quality for toddlers.

While the analysis results of the relationship between maternal hygiene behavior and drinking water quality for toddlers found that there were 7 respondents (7.3%) who implemented good hygiene behavior and had qualify drinking water quality for toddlers. While there were no respondents who did not apply good hygiene behavior and did not meet the quality of drinking water for toddlers. Chi-square test results obtained $p = 0.594$, it can be concluded that there is no significant relationship between maternal hygiene behavior and drinking water quality for toddlers.

Discussion

The source of drinking water doesn't have a significant relationship with the quality of drinking water for toddlers ($p = 0.247$). The source of drinking water is one of the factors that determine whether or not drinking water is suitable for consumption. Utilization of water for various needs must pay attention to water quality parameters in accordance with predetermined quality standards⁹. Based on regulation of the Minister of Health No. 736 of 2010, drinking water sources can be obtained from bottled water, water that is distributed through pipes for domestic use, and water that is distributed through water tanks. All types of drinking water sources

must be qualified, seen from the physical, chemical, microbiological, and radioactive quality¹⁰. Drinking water quality standards in Indonesia are regulated in the Regulation of the Minister of Health No. 492/MENKES/PER/IV/2010⁵. Even so, there is no guarantee that the quality of drinking water from a particular source will be better than other sources due to many other supporting factors, such as community behavior and environmental conditions around the water source¹¹. This is in line with the results of research from the Faculty of Public Health, University of Indonesia, which states that drinking water sources do not have a significant relationship with drinking water quality ($p = 0.720$) with an OR value = 1.541 [95% CI: 0.350-6.790]¹².

The availability of clean water sources is an effort to meet basic needs and improve public health status¹³. Environmental health is organized to create a healthy environment, which is a situation that is free from risks that endanger the health and safety of human life⁽⁴⁾. Environmental health includes water sanitation, which is the security and determination of water quality for various needs and human life. Thus the water that is used for daily needs in addition to meeting or being sufficient in quantity must also meet the quality that has been determined. The importance of good quality water needs to be provided to meet basic needs in preventing the spread of infectious diseases through water¹⁵.

Based on result of the study, most of respondents (96%) in Tapos Sub-district have good knowledge about the requirements for adequate drinking water, as well as a good and correct way to process and store drinking water, but percentage of the amount of quality drinking water that does not qualified is still many. Based on previous research, explaining that knowledge alone is not enough to form an attitude. Attitude is a reflection of various psychiatric symptoms such as desires, interests, knowledge, emotions, motivation, and willing¹¹. In addition, research conducted by Aulia¹⁶ linking community knowledge to well water quality also found that there was no significant relationship between the two. The water quality tested was turbidity ($p = 0.181$), odor ($p = 0.504$), taste ($p = 0.653$), and coliform ($p = 0.855$).

While the hygiene behavior of respondents towards drinking water, 84% of respondents had implemented

good hygiene behavior, including cooking and storing drinking water in clean and closed containers, but respondents who implemented good hygiene behavior and had good drinking water quality were only 8.3 %, and most of the rest have poor drinking water quality. This is actually quite confusing because good hygiene behavior should be followed by good drinking water quality, but returning to the concept that behavior is influenced by many factors, including factors outside of the respondent that can cause hygiene behavior cannot be carried out optimally¹¹.

In drinking water that is not treated properly will contain *Escherichia coli* bacteria that can be harmful to the health of toddlers¹⁷. *Escherichia coli* is a bacterium that can be used as an indicator of sanitation bacteria. Sanitary indicator bacteria are bacteria whose presence in food indicates that water or food has been contaminated by human waste. Indicators of sanitation are generally bacteria that are common and live in the human intestine, so that the presence of these bacteria, shows that in the stages of water or food treatment has been in contact with feces from the human intestine and may contain other dangerous pathogenic bacteria¹⁸. Humans are infected with *Escherichia coli* through the oral fecal pathway according to the F (fluid, finger, field, and food) diagram, mainly through consumption of contaminated food and drinking water¹⁰.

Conclusions

Based on the analysis results of research conducted on 100 respondents in Depok City Tapos Sub-district about the relationship of drinking water sources, knowledge and hygiene behavior of mothers to the quality of drinking water for toddlers can be concluded as follows :

a. Most of the people (62%) use drinking water from ground water. While the other 38% uses refill drinking water.

b. Most respondents (96%) already have good hygiene knowledge.

c. Most respondents (84%) have implemented good hygiene behavior to maintain the quality of drinking water for toddlers.

d. There was no significant relationship between

drinking water sources, knowledge and hygiene behavior of mothers with toddlers drinking water quality (p = 0.247 for drinking water sources, p = 1,000 for hygiene knowledge of mother, and p = 0.594 for hygiene behavior of mother).

Ethics Approval

The study protocol was approved by The Research and Community Engagement Ethical Committee Faculty of Public Health, University of Indonesia (Ket-07/UN2.F10.D11/PPM.00.02/2019).

Conflict of Interest

The authors declare that no conflict of interests, including of specific financial interest, relationships, and/or affiliations relevant to the subject matter or material included in this manuscript.

Acknowledgement

This result was supported by postgraduate research funding (HIBAH PITTA B) from University of Indonesia. We would also like to say thank you to Tapos Sub-district Health Center for sharing some information during the research, also to the laboratory of Public Health Faculty as a water drinking inspection site.

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A Study of Antibacterial Effect of *Nigella Sativa* Seed Extract on Clinical Isolates of Methicillin-Resistant *Staphylococcus Aureus* (MRSA)

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Abstract

Objective: A study of antibacterial effect of *Nigella sativa* seed extract on clinical isolates of Methicillin-resistant *Staphylococcus aureus* (MRSA).

Methods: Samples received at Microbiology laboratory attached to a tertiary care hospital in a period of three months which yield either heavy growth of *Staphylococcus aureus* or pure growth of *S.aureus* from patients with wound infection were included in the study. We did punch well diffusion method to determine the antibacterial effect of *Nigella sativa* seed extract against *S.aureus* isolates.

Results: For MRSA strains, the average zone size for concentrated solution of the seed extract was 25.45± 1.05 mm.; that for 1 in 5 dilution of the extract (166 mg/ml) was 17.75± 1.07 mm and that of 1in 10 dilution (90.9 mg/ml) was 12.30± 0.865 mm. The zone size for 1 in 20 dilutions (47.62 mg/ ml) was not consistent. Out of the 20 MSSA strains tested, 16 (80%) did not show any zone. Out of the 20 MRSA tested, 17 (85%) did not show any zone of inhibition, so the average zone size for 1 in 20 dilution of the extract, was 1.45±2.98 mm for MRSA and 1.10± 2.69 mm for MSSA. For MSSA strains the average zone size for concentrated solution of the seed extract was 25.55± 1.05 mm.; that for 1 in 5 dilution of the extract (166 mg/ml) was 17.55± 1.05 mm and that of 1in 10 dilution (90.9 mg/ml) was 12.30± 0.923 mm.

Conclusion: The present study shows the antibacterial effect of the methanolic extract of *N.sativa* against our clinical isolates of *S.aureus*.

Keywords: Biopharmaceuticals, Methanol, MRSA, *Nigella sativa*, Seeds, *Staphylococcal* infection,

Introduction

Microbial resistance to majority of antibiotics has led to increase in alternative use of antimicrobial agents that can help in the treatment of diseases.¹ Methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the most frequent pathogenic bacteria isolated in clinical and laboratory practices. New antimicrobials are required to combat this problem.¹

Plant extracts have been known to have certain antimicrobial effects. One such example is the seeds of *Nigella sativa* belonging to family Ranunculaceae, commonly known as black seed or black cumin. The biological activity of the seeds is said to be due to thymoquinone which has anti-inflammatory, analgesic, antipyretic, antimicrobial and antineoplastic activity.²⁻⁵ The antimicrobial activity of *N. sativa* seed extract has been extensively studied for its action against a wide range of bacterial, fungal and parasitic organisms. However, its efficacy against MRSA has limited data as far as Indian studies are concerned.²⁻⁵ So, we studied the antibacterial effect of methanolic extract of *N. sativa* seed on MRSA and Methicillin-sensitive *Staphylococcus aureus* MSSA isolated from the cases of

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wound infection.

Materials and Methods

It was a prospective study for the duration of 3 months from 1st January 2017 – 31st March 2017. Samples received at Microbiology laboratory attached to a tertiary care hospital in this period which yielded either heavy growth of *Staphylococcus aureus* or pure growth of *S.aureus* from patients with wound infection were included in the study. Samples received on dates other than the three months period or which do not yield *S.aureus* or yield scanty or mixed growth of *S.aureus* with other organisms were excluded from the study. Non random sampling was done. Institutional ethics committee clearance was obtained for the present study.

Hundred grams of dried and powdered seeds (Fig. 1) was subjected to Soxhlet apparatus using methanol as a solvent for 4h. The extract obtained was filtered using whatman filter paper no.1. The filtrate was concentrated using mantle and stored at 4 °C for further use.⁶

Antimicrobial susceptibility testing: The extract was diluted by double dilution (1:5, 1:10 and 1:20) in 10% dimethyl sulfoxide (DMSO). An overnight broth culture of various clinical isolates of MRSA and MSSA in Muller Hinton broth was standardized to 0.5 McFarland and a lawn culture of each isolate was made on

Muller Hinton agar plates. The wells of 6 mm diameter were made and 50 µl of extract of different dilutions and also pure DMSO were inoculated into the wells and incubated overnight at 37° C. The zones of inhibition around the wells were measured.⁷

Results

Table 1 shows the results of antibacterial activity of the *N. sativa* seed extract on 20 strains each of MRSA and MSSA expressed as zone size in mm. For MRSA strains, the average zone size for concentrated solution of the seed extract was 25.45± 1.05 mm.; that for 1 in 5 dilution of the extract (166 mg/ml) was 17.75± 1.07 mm and that of 1 in 10 dilution (90.9 mg/ml) was 12.30± 0.865 mm. The zone size for 1 in 20 dilutions (47.62 mg/ml) was not consistent. Out of the 20 MSSA strains tested, 16 (80%) did not show any zone. Out of the 20 MRSA tested, 17 (85%) did not show any zone of inhibition, so the average zone size for 1 in 20 dilution of the extract, was 1.45±2.98 mm for MRSA and 1.10± 2.69 mm for MSSA. For MSSA strains the average zone size for concentrated solution of the seed extract was 25.55± 1.05 mm.; that for 1 in 5 dilution of the extract (166 mg/ml) was 17.55± 1.05 mm and that of 1 in 10 dilution (90.9 mg/ml) was 12.30± 0.923 mm. (Fig. 2)

Table 1: The results of antibacterial activity of the *Nigella sativa* seed extract on 20 strains each of MRSA and MSSA expressed as zone size in mm.

S.aureus Isolates*	Dilutions of the extract				10% DMSO
	Neat (m.m.)	1 in 5 (m.m.)	1 in 10 (m.m.)	1 in 20 (m.m.)	
MRSA n = 20	25.45± 1.05	17.75± 1.07	12.30± 0.865	1.45± 2.98	0
MSSA n =20	25.55± 1.05	17.55± 1.05	12.30± 0.923	1.10± 2.69	0



Figure 1: Seeds of *N.sativa*

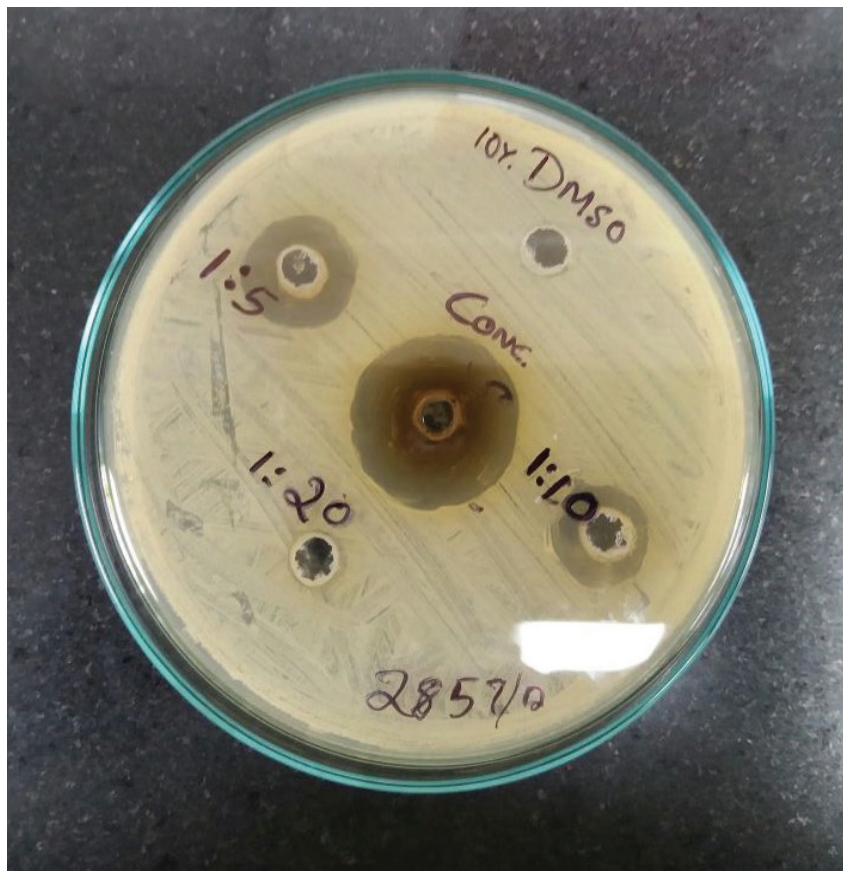


Figure 2: showing the zone of inhibition by *N.sativa* seed extract on *S.aureus*

Discussion

In a study methanolic extract of the seed was investigated for the presence of novel bioactive compounds using Gas Chromatography and Mass Spectrometry analysis method. The results showed that methanolic seed extract contains 13 novel bioactive compounds and has remarkable antifungal activity.⁶ The biological activity of the *Nigella sativa* seed extract is said to be due to thymoquinone which has anti-inflammatory, analgesic, antipyretic, antimicrobial and antineoplastic activity.²⁻⁵

In a study using ground seeds suspended in sterile distilled water was used, clear inhibition of the growth of *Staphylococcus aureus* was observed at a concentration of 300 mg/ml. No inhibition was found in the growth of *E.coli* and *Enterobacter* spp.³ In a study methanol extract at the concentration of 100 mg/mL had a remarkable sensitivity towards all tested bacteria in this study. But aqueous extract of the seed was not effective against gram negative bacteria.⁴ In a study on effect of *Nigella sativa* seed oil extract on MRSA isolated from diabetic wound infection, out of 19 isolates, 8 (42%) were sensitive to undiluted oil sample; 4(21%) of these showed sensitivity at 200 mg/ml, 400 mg/ml and 800 mg/ml respectively. Eleven (58%) of the isolates were completely resistant to all the oil concentrations.⁵

In a study the isopropanol extracts showed the best antimicrobial potential. It significantly inhibited the growth of almost all the pathogenic bacteria tested. The methanol and ethanol extracts showed the highest activity on 5th and 9th day of germination. Some of the results showed that the extracts were better antibacterial agents when compared with commercially available broad-spectrum antibiotics.⁷

In a study the methanolic extract and oil of *Nigella sativa* were found active against 38 and 35 multi-drug resistant strains respectively. Both the oil and methanolic extract showed remarkable dose dependant antibacterial activity against the tested strains up to a dilution of 1:50 as evident from the zones of inhibition.⁸

In a study distilled methanolic extracts of *N. sativa* showed significant antimicrobial activity against tested clinical strains of Gram-positive and Gram-negative bacteria. Results showed day-dependent and dose-

dependent activity and a significant antimicrobial effect was observed as germination proceeded.⁹

N. sativa ground seeds in a dose of 2 g/d when given along with 40 mg/d omeprazole possess clinically useful anti-*Helicobacter pylori* activity, comparable to that of the standard triple therapy.¹⁰

A statistically significant inhibitory effect on biofilm formation by *S.aureus* ATCC 25923 and *S. epidermidis* CIP 106510 was noted after TQ supplementation.¹¹ The study showed thymoquinone (TQ) had a good antibacterial effect with MICs values in the range of 8 to 32 µg/ml especially against Gram-positive cocci (*S.aureus* ATCC 25923 and *S. epidermidis* CIP 106510).¹¹ A study showed antibacterial activity against *S.constellatus* with a MIC of 4 µg/ml. The essential oil showed the strongest activity against *S. mitis*, *Streptococcus mutans*, *S. constellatus* and *Gemella haemolysans* with an MIC of 2.13 mg/ml, but against *Enterococcus faecalis* and *E. faecium* less effective with an MIC of more than 8.5 mg/ml.¹²

It also showed TQ (150 µg/disk) was very effective against *S. mutans* and *S. mitis* (zone of inhibition were: 24.5 ± 0.71 and 22 ± 1.41 mm, respectively) also weak antibacterial activity against *E. faecalis*, *E. faecium* and *S. salivarius* (9 ± 0.00 , 9.5 ± 0.71 and 9.5 ± 0.71 mm, respectively).¹² The essential oil (2.43 mg/disc) also had good activity against *S. mitis*, *S. oralis*, *S. mutans*, *S. constellatus* and *G. haemolysans* with a zone of inhibition ranging from 13.5 to 15.5 mm, but not effective against *E. faecalis*, *E. faecium* and *S. salivarius*.¹²

In a study the seed extract has been loaded into the polymeric micelle and its effectiveness has been evaluated against *Staphylococcus aureus*, *Bacillus subtilis* and *Escherichia coli* by in vitro disc diffusion method *Nigella sativa* loaded polymeric micelles was found to be more efficient in comparison to plain extract.¹³ A study showed that *N.sativa* oil had good antibacterial action against *S. aureus* in comparison to *P. aeruginosa*.¹⁴ A clinical trial showed that the crude extract was as nearly effective as the standard drug, mupirocin on neonates with pustules, no side effect was observed.¹⁵

Our study results are consistent with the studies conducted in the past. We too found significant antibacterial activity of *N. sativa* extract against *S.aureus*

both MRSA strains and MSSA strains isolated from cases of wound infection. As *N. sativa* is a nontoxic edible substance easily larger doses of this extract may be considered for the treatment of wound infection.

Conclusions

We found significant antibacterial activity of methanolic extract of *N. sativa* by punch well agar diffusion method against 20 strains each of MRSA and MSSA isolated from cases of wound infection

Ethical Clearance- has been taken from the Institutional Ethical Committee

Source of Funding- Self, no external funding

Conflict of Interest – The authors have no conflict of interest

Conference presentation: The article has been presented as POSTER in the annual parasitology conference, TROPACON 2019 in KMC, Manipal.

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The Effect of Emotional Condition and Auditory Skills on Communication Ability in Children with Autism Spectrum Disorder

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Abstract

Autism spectrum disorder (ASD) is characterized by deficiencies in social communication, social interaction, interests, and repetitive activities. Children with this disease have difficulty to control emotions, anger, aggression, fear of certain things, and sometimes suddenly laugh so that it can interfere in the communication process. This study analyzes the effect of emotional conditions and auditory skills on communication ability in children with ASD at the Technical Implementation Unit of Children with Special Needs, Sidoarjo, and the respondents of this research are 14 parents of ASD child. The research used comparative analytic with a cross-sectional design and regression test. The results show that there is a significant effect between emotional conditions with communication ability in children with ASD; if the emotional condition could be reduced as much as eight times, so the communication ability could be performed well. Similarly, auditory skills could significantly affect communication ability if it increased by roughly 1.5 times. This research concludes that it is considered essential to create a conducive emotional condition and improve the ability to hear in children with ASD so that they have excellent communication ability.

Keywords: *Autism spectrum disorder (ASD), emotional condition, auditory skills, communication ability*

Introduction

Autism spectrum disorder (ASD) is a spectrum of several disorders characterized by deficits in social communication and social interaction and limited behaviors, interests, and repetitive activities. The word autism originated in 1943 when Austrian-born American psychiatrist Leo Kanner distinguished this disorder from schizophrenia. Kanner describes this disorder as the inability to interact with other people, language disorders that are indicated by delayed language acquisition, echolalia, sentence reversal, repetitive and stereotypical play activities, strong memory routes and obsessive desires to maintain order in their environment.

One in 160 children worldwide is estimated to suffer from ASD. These estimates represent the average number and reported prevalence varies substantially in all the studies conducted. Based on epidemiological studies conducted over 50 years, the prevalence of ASD appears to be increasing globally. There are many possible explanations for this tangible improvement, including raising awareness, expanding diagnostic criteria, better diagnostic tools, and better reporting¹. Based on 11 communities in the United States (Arizona, Arkansas, Colorado, Georgia, Maryland, Missouri, New Jersey, North Carolina, South Carolina, Utah, and Wisconsin), in 2012, 1 in 68 children identified as ASD. There has been no official survey of the number of children with ASD in Indonesia. In 2013 the Director of the Ministry of Health's Mental Health Development had estimated the number of autistic children in Indonesia to be around 112 thousand with a range of 5-19 years. This number

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based on the count of autism prevalence of 1.68 per 1000 children under 15 years of age. With the number of children aged 5-19 years in Indonesia amounting to around 66 million, according to the Central Statistics Agency in 2010, the figure was 112 thousand². In 2015 it was estimated that there are approximately 12,800 children with autism or 134,000 with autism spectrum in Indonesia.

According to the Head of East Java Education Agency (East Java), Suwanto, in East Java in 2009 there were 388 Special Schools with 13,159 students and 93 inclusive schools with special needs students 1,476 children with 15% of them were autistic children. In East Java, there are also several Technical Implementation Units for Children with Special Needs, one of which is the Technical Implementation Unit of Children with Special Needs in Sidoarjo Regency. Based on the recapitulation of data on children served in the Technical Implementation Unit of Children with Special Needs in Sidoarjo Regency in 2015 - 2018, the total number of children is 209 children. Of these, ten are inactive. Of 199 active children, 65 children had ASD. The number of autistic children in the Inclusion School from the level of Early Childhood Education to High School/ Vocational Middle School in Sidoarjo Regency in 2016 amounted to 88 children. Various studies conducted on autism show that half to two-thirds of children with ASD do not experience ordinary language and communication development so that they experience difficulties in language and communication³. Around 30-50% of individuals with autism spectrum disorder (ASD) remain at least verbal throughout their lives, with little or no functional talk⁴. Autistic children included in the category of extraordinary children, namely children with social and emotional disorders. Physically autistic children are no different from normal children. If an

autistic child has normal intelligence, it is expected that the child could achieve a specific job. It only needs an emphasis on exercises for restoring body functions, adjustments, or prevocational. Conversely, if an autistic child has below normal intelligence, the possibility of a child lacking or unable to have a skilled vocational level. Children with ASD who develop oral communication continue to show an increased risk of delay/speech disruption at an early age and a significantly higher risk of speech errors and prosody and voice abnormalities⁵.

This study analyzes the effect of emotional conditions and listening skills on communication skills in children with ASD. The benefits of this study are to find effective methods for the learning process of ASD children in improving communication skills.

Material and Methods

The research used comparative analytic with a cross-sectional design. Data collected through questionnaire and analyzed by regression. The subjects of this study were parents of children with ASD in the Technical Implementation Unit of Children with Special Needs in Sidoarjo Regency, totaling 14 people.

Results and Discussion

The regression test results show that there is a significant influence between emotional conditions and communication skills in children with ASD with a value of $p = 0.021$ and regression models $155.294 - 8.002$ which means excellent communication skills if the emotional condition decreases by 8.001 times. Likewise, with listening skills with communication skills, there is a significant influence with $p = 0.002$ and a regression model of $0.063 + 1.546$, which means excellent communication skills if listening skills increased by 1.546 times.

Table 1. Autism Spectrum Disorder Children in Technical Implementation Units of Children with Special Needs in Sidoarjo Regency in 2018

No	Characteristics	Frequency	Percentage
1	Age:		
	5-7 years	5	35.7
	8-10 years	8	57.1
	11-13 years	1	7.2
		14	100

Cont... Table 1. Autism Spectrum Disorder Children in Technical Implementation Units of Children with Special Needs in Sidoarjo Regency in 2018

2	Sex:		
	Male	10	71.4
	Female	4	28.6
		14	100
3	School level:		
	Elementary school grades 5-6	1	7.1
	Elementary school grades 3-4	5	35.7
	Elementary school grades 1-2	2	14.3
	Special elementary school grades 1	1	7.1
	Kindergarten	3	21.5
	No school	2	14.3
		14	100

Rosengren⁶ defines communication as a purposive subjective interaction through human language that has a dual articulation based on symbols. According to Kowalski⁷, children's communication skills could be observed in the following six areas. The first is the area of social interaction illustrates the child's ability to interact with other individuals, friends, smaller children, or adults. The second is the area of social communication that compares the ability of individuals to communicate with others using verbal and nonverbal languages. The third is that the academic communication area provides an overview of the level of individual social skills that commonly seen in academic settings. The fourth is the non-verbal communication area describes the ability of individuals to recognize and use non-verbal communication. The fifth is the area perspective taking describes the ability of an individual to recognize the other person's point of view, interests, and feelings of others, and also other people's problems. The last is the emotional-social area describes the ability of an individual to recognize his emotional state and the emotions of others and use the right words to describe those emotions⁷.

The communication development in autistic children is very different, especially in children who experience severe obstacles in language acquisition and speech. Children with ASD have difficulties in communication due to problems in the language (verbal and nonverbal), which related to the existence of central nervous system disorders⁸. Three locations suspected of having different patterns compared to normal children are cerebral-brainstem circuits, limbic system, and cerebral cortex

circuits. This condition is allegedly related to disorders of cognitive development, language, emotions, and social interaction. In some instances, emotional problems in children with ASD vary in their forms.

Some previous studies have found that children with ASD experience an inability to make useful contacts with others and have difficulty reading other people's expressions, have difficulty recognizing certain emotions, and have difficulty expressing their emotions. Philip et al.⁹ found a substantial emotional recognition deficit in the face, voice, and body among adults with ASD. The limbic system is one part of the brain that has abnormalities in autistic children has a vital role in the emotional process in children with ASD. Disorders in the limbic system, which is the center of emotion results in autistic children having difficulty controlling their emotions, quickly raging, angry, aggressive, crying, afraid of certain things, and suddenly laughing. Also, children become hyperkinetic, aggressive, refuse to do activities for unclear reasons, bang their heads, bite, scratch, or pull hair¹⁰.

One of the functional areas of the central nervous system that is impaired is sensory processing. Children with sensory processing disorders cannot integrate the emotional data that enters and interprets it from various perspectives. Emotional processing can be confused by those who are too reactive or less reactive. Sensory reactivity or processing disruption can cause children to misinterpret emotional information from the surroundings resulting in inappropriate or extreme emotional reactions¹¹. Emotional problems that occur

in children with autism will affect their ability in communication.

Williams et al.¹² suggest that children with autism have imitative problems that may be related to abnormal functions of “mirror neurons” (MNs). These neurons encode for the same action, whether it is felt or done¹³. Kohler et al.¹⁴ showed that “mirror neurons” in the F5 area of the monkey brain responded to sound and saw action. Cells in the superior temporal sulcus possess MN properties, and these two areas also associated with cross-modal binding and audiovisual integration in speech perception^{15,16}. The superior temporal sulcus is also an area that involved in autism psychopathology because of its role in detecting the direction of attention of other individuals and understanding mental states communicated by eye movements¹⁷.

According to Ayres¹⁸ research, children receive information in a sequence, from the skill of touching to vision, then to hearing, and cognitive skills. Children must fulfill the requirements in the form of maturity in several skills for language learning and communication, namely attention skills, visual skills, auditory skills, physical skills, imitation skills, and cognitive skills. Meanwhile, the fundamental problem for children with ASD is a short attention span, which affects information storage (obtained from visual, auditory, and tactile sensory devices) and cognitive function. Excellent listening skills support the ability to communicate in children with ASD.

Children’s auditory sensitivity could change with development^{19,20}. Some levels of necessary hearing skills are related to the acquisition of ordinary language, school readiness, and academic achievement, especially reading²¹.

Conclusion

Emotional conditions affect listening skills and communication skills in children with Autism Spectrum Disorder.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: All funds used to support this research comes from the researches themselves.

Ethical Clearance: Ethical feasibility permit issued by the Health Research Ethics Commission, Faculty of Public Health, Universitas Airlangga with Ethical Approval No. 1905-KEPK.

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The Spatio-Temporal Pattern of Dengue Haemorrhagic Fever, Khon Kaen Province, Thailand During 2008 – 2017

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Abstract

Background: Dengue haemorrhagic fever (DHF) is a major problem in public health of the world and in tropical area especially Africa and South-East Asia. An endemic area of DHF in Thailand has begun since 1949. DHF in Khon Kaen province increased and transmitted into all areas. This study examined the spatio-temporal pattern of DHF incidence in Khon Kaen during 2008-2017.

Method: DHF data were obtained from Bureau of Vector Borne Disease, Khon Kaen province during 2008 – 2017 were geo-code at sub-district level. The data were acquired a space-time with elevated proportions of DHF incidence rate. The spatio-temporal technique analysis were conducted for a DHF transmission.

Result: The DHF outbreak in Khon Kaen province, Thailand were decrease in every year but DHF was shifted from urban areas to rural areas. The spatial clustering analysis were identified the risk areas in the district that closed Nakhon Ratchasima province and shifted to Udon Thani province in 2015.

Conclusion: The DHF clustered map is one of the best measurement for identified a risk area for surveillance. It has been an effectiveness prevention and controlling plan and allocated a resources of DHF.

Keywords: dengue haemorrhagic fever, spatio-temporal pattern, Thailand.

Introduction

Dengue haemorrhagic fever (DHF) is a major public health problem in many countries around the world. It has spread widely and a number of patients has increased in 30 years. DHF is endemic areas especially tropical/sub-tropical region.⁽¹⁾ DHF is caused by dengue virus including *Aedes aegypti* and *Aedes albopictus* which are the important disease carrier. *The Aedes albopictus* is a common mosquito and house mosquito. A virus is in a blood that from a mosquito biting and a lot of virus access to the mosquito's stomach and replicate to grow more

virus. Then virus travel to the salivary glands and readily enter to host who is being next bitten. When an infected mosquito bites to any person, it can be transmitted to that person and causes the person to become ill.⁽²⁾

DHF in Thailand has begun transmission throughout the country since 1949. The outbreaks was found in Bangkok in 1958. There were 2,158 DHF cases. The incidence rate of 8.8 per 100,000 population and mortality rate of 13.90%. DHF was spread to various provinces especially an urban area with hard density and convenient transportation and found cases in every province of Thailand since 1958-2002. The situation of DHF in Thailand was increase continuously.⁽²⁾

The DHF pandemic in Khon Kaen province found every years. DHF incidence rate from 2008 to 2015 were 50.05, 59.78, 66.07, 170.38, 24.70, 127.22, 44.79

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and 24.51 by sequence. However, DHF in Khon Kaen province increased in the past and decrease from 2014, a researcher will be used a lot of measurements to explain a pandemic disease.⁽³⁾

One of measurement methods to explain and determine a risk area is Geographic Information System (GIS). This study was aimed to explain a DHF incidence rate of Khon Kaen Province from 2008 – 2017, by analysing DHF incidence data spatial and temporal.

Method

Study area

Khon Kaen is one of the province in Thailand. It located between 16° 25' 50» north latitude and 102° 37' 0» east longitude and exist of 10,885.991 square kilometers. The province consisted of 25 districts, an area was subdivide using its political-administrative division.

Data Collection

DHF incidence rate in Khon Kaen province for the year from 2008-2017 were obtained from Bureau of Vector Borne Disease, Khon Kaen province, Thailand. There were comply for spatial analysis. This study was approved by the ethical committee in Khon Kaen University IRB.

Implementation of GIS and Spatial Analysis

The spatio-temporal of DHF incidence rate in Khon

Kaen province, Thailand was obtained in the boundary of shapefile for DHF incidence rate from DIVA-GIS.⁽⁴⁾ Quantum GIS version 2.8.5 and custom encode were used as tool to generate a polygon shapefile from a map of district boundaries were generated. The DHF incidence rate was described a temporal distribution in each district were used as characterize outbreak pattern of DHF from secondary data from 2008 – 2017.⁽⁵⁾

Spatial Cluster Analysis

The Local Indicators of Spatial Association (LISA) was used for a spatial cluster of DHF incidence rate at the district level in Khon Kaen province, Thailand during 2008 – 2017 using Geoda software.⁽⁶⁾ The cluster analysis including time measure of incidence rate were performed to detect the DHF cluster under area study. The frame of a study area were included a different sets of neighbouring districts. The cluster were identified a comparison of the expected and observe incidence rate.⁽⁷⁾

Result

The total number of 12,263 DHF cases in Khon Kaen province were reported during 2008 – 2017. The DHF incidence rate had increased since 2008 to 2013 and were slightly decrease since 2014 to 2017. The highest DHF incidence rate (169.10 per 100,000 populations) appeared in the year 2013 as shown in Figure.I. Mueng district and Manjakiri district of Khon Kaen had the high incident rate at that time.

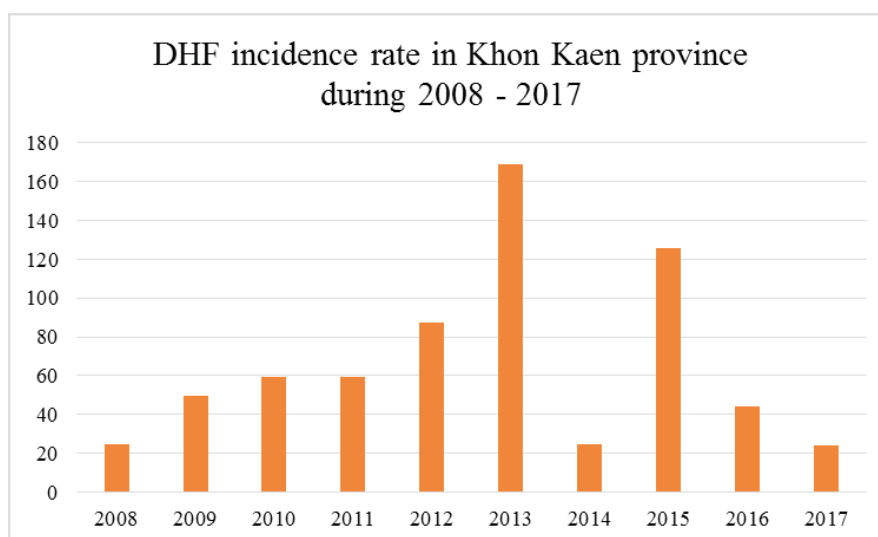


Figure I. Dengue Haemorrhagic Fever incidence rate in Khon Kaen province, Thailand during year 2008 - 2017

Spatial Distribution of DHF in Khon Kaen province, Thailand.

The spatial distribution of DHF incidence rate in Khon Kaen province were reported by Bureau of Vector Borne Disease, Khon Kaen province, Thailand where had 25 districts. The area was divided by quartiles from year to year. DHF incidence rate was highest at Mueng and Manjakiri district during 2008 – 2017. DHF was transmitted into Ban Phai district during 2010 – 2011 and Waeng Noi district during 2009 – 2013.

Spatial Clustering of Dengue Haemorrhagic Fever (DHF) in Khon Kaen province, Thailand during 2008 - 2017

Statistically significant spatial clusters of districts with DHF incidence rate during 2008 – 2017 were identified in Khon Kaen province. This study was identified cluster in Wang Noi district during 2008 – 2011. The cluster in Wang Noi district shifted to Ban Phai district in the year 2014 and also shifted to Nong Song Hong district in the year 2017. Therefore, DHF incidence rate were decreased but an observed cluster was changed to border area.

Discussion

The study used a spatial analysis method in GIS to map and analyzed a surveillance dataset of 10 years. This method was able to formulate the boundary of DHF incidence rate on the risk area. (8,9,10,11) The spatial pattern was confirmed by the spatial clustering analysis of data and the transmission trend of Khon Kaen province during 2008 – 2017.

The DHF incidence rate decreased but the transmission distributed to rural area (Ban Phai and Waeng Noi district) which closed an urban area of Khon Kaen province. Dengue Fever both occurred and spread in the rural areas. (12,13) The clustered of DHF in Khon Kaen province was not found in the urban area. However, it was found at some district in Khon Kaen province near the border of Nakhon Ratchasima and Udon Thani province. These two provinces also had a high DHF incidence rate in north-eastern region. (3) The violence situation affected on communicable disease control. In addition, climatic change was also a main influence on DHF occurring. (14) A one of cause of DHF

in Khon Kaen province was a lot of migrant workers from Laos and Cambodia. (15) Hence, the DHF incidence rate were still high in urban area and distributed to rural area. Thai governmental organization should consider to apply the spatial map and the clustered map as a tool to determine a policy to control a DHF transmission on the risk areas.

Conclusion

Dengue Hemorrhagic Fever (DHF) in Khon Kaen from 2008-2017 had a potential to decrease. The spatio-temporal analysis was shown a spatial relationship of DHF. The DHF clustered map will be an important tool to identify the surveillance areas. It will make an effectiveness prevention plan and to allocating resources for DHF controlling and prevention.

Ethical Clearance: Taken from Khon Kaen University IRB.

Source of Funding: This study was supported by self.

Conflict of Interests: the authors declare no potential conflict of interests.

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The Effect of Knowledge, Characteristics, Unsafe Action and Unsafe Conditions on Workplace Accidents In PT Suzuki Indomobil Bekasi - Indonesia

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Abstract

Workplace accidents are unexpected incidents and cause losses that are the result of a series of incidents that involving causal factors, immediate causes which closely related to accidents, indirect causes, and basic causes. Based on work accident data of PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, from 2011 to 2015 there were 11 cases of accidents in Section Welding.

This is a descriptive cross sectional study design that aims to determine the effect of knowledge, the characteristics of workers, unsafe actions and unsafe conditions with occupational accidents. The variables studied were knowledge, the characteristics of workers that the indicator consists of age, working period, unsafe action that consists of skill-base error, decision error, and routine violation, unsafe conditions that consists of the conditions of personal protective equipment, lighting, and noise, and workplace accidents. Data were analyzed by univariate and bivariate by using chi-square.

The results showed that workers injured at work in the past year as many as 10 workers (11.9%). From the results of statistical tests, the variables that have an impact is unsafe condition occupational accidents (p value = 0.030).

Based on research, the advices are that company needs to conduct training about occupational health and safety so that workers more aware of the potential dangers around their job, the active role from supervisor or inspector such a warning the workers when they work unsafely, increasing the quantity of personal protective equipment, do the periodically measurement of lighting system, and do the deep accident investigation.

Keywords : *Knowledge, Characteristics, Unsafe Action, Unsafe Conditions, Workplace Accidents*

Introduction

Industrial developments in Indonesia having a rapid growth, significantly contributing to national economic growth, such as creating jobs and becoming one of the main sources of state acquisition. But the development of this industry is not in line with the development of work environment conditions which can lead to workplace accidents¹. The number of cases of accidents in Indonesia is still high.

BPJS Ketenagakerjaan states that the number of workplace accidents in 2012 occurred 103,000 cases, in 2013 occurred 192,911 cases, 2014 occurred 129,911 cases, and in 2015 occurred 105,182 cases of

accidents. From that data, there are no significant changes made by companies in Indonesia to prevent accidents in the work area. The result of research the National Safety Council showed that the cause of accidents 88% due to unsafe action, 10% due to unsafe condition, and 2% from unknown cause².

From that statement, many work accidents due to the unsafe action. Other accident factors caused by misperceptions due to underestimation of a hazardous condition or an unsafe work environment, intentionally violation, and wrong priorities in doing the job³. The key to preventing accidents is to eliminate unsafe actions that affect for 98% causes of accidents⁴.

This research was held in PT. Suzuki Indomobil Motor Plant Tambun II as an automotive manufacturing. This industry uses raw materials such as iron plates and other car body components. The process includes in Welding Section are welding car components such as parts of the frame, under body, front floor, rear floor, side body, main body, door panels and floor decks. In Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W Bekasi, West Java there are accident hazard factors such as pinched by welding equipment, splashed welding sparks, and scratched iron plate.

Based on accident rate at PT. Suzuki Indomobil Motor Plant Tambun II-4W in 2011 there are 6 accidents, 2012 occurred 2 accidents, in 2013 occurred 1 accident, in 2014 happened 1 accident, and in 2015 happened 1 accident. The types of accidents that injury by pinched tip gun, hit by pallet trolley which containing components, and pinched by holder upper gun. Observation in 2015 at Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, is known of the workers who did not use gloves and a helmet while working, and there are some workers who work while joking.

The type of study is a descriptive analytic study to get a descriptive of worker characteristics, unsafe actions, and unsafe conditions with workplace accident in Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W. This study used a cross-sectional, dependent and independent variables observed at the same time. Population in this study were all workers in Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, as many as 497 workers. Sample which taken in this study using simple random sampling technique.

The assessment criteria which used for the questionnaire involving knowledge, worker characteristics such as age and working period, unsafe action such as skills-base error, decision error, routine violation, and unsafe condition such as the condition of personal protective equipment (PPE), lighting, and noise.

Method

The design of study was observational and cross sectional research for looking at unsafe act and unsafe condition on workplace accidents, as explaining the causality relationship between variables through hypothesis test. So that, this research is explanatory. The type of study is a descriptive analytic study to get a descriptive of worker characteristics, unsafe actions, and unsafe conditions with workplace accident in Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W. This study used a cross-sectional, dependent and independent variables observed at the same time.

Population in this study were all workers in Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, as many as 497 workers. Sample which taken in this study using simple random sampling technique. Primary data in this study collected by observation using a questionnaire which spread to workers in Welding Section. The questionnaires have previously been tested for validity using SPSS Product Moment and reliability using SPSS Cronbach Alpha. The results of the questionnaire were declared all valid and reliable.

In this study, several stages were also carried out as follows: (1) editing; (2) coding; (3) scoring; and (4) tabulating

Univariate analysis is used to see an overview of the frequency distribution and the percentage of each variable (bound and free). The dependent variable consists of workplace accidents in Section Welding and Unsafe Behavior. Independent variables consist of knowledge, characteristics of workers (age and duration of work), unsafe behavior (skill errors, decision errors, and routine violations), and unsafe conditions (Personal Protective Equipment, lighting, and noise). The data analyzed by SPSS 17.00 using *chi-square* method (Bivariate analysis). Chi-square is one type of non-parametric comparative test performed on two variables, and the data scale of the two variables is nominal. Chi-square is an analysis test for categorical data types.

Results and Discussions

Table 1: The Effects of Knowledge with Workplace Accidents

Knowledge	Workplace Accidents				Total		P value
	Never Happened		Happened				
	N	%	N	%	N	%	
Good	71	84,52	10	11,90	81	96,42	1,000
Almost Good	3	3,57	0	0	3	3,57	
Not Good	0	0	0	0	0	0	
Total	74	88,09	10	11,90	84	100	

Source: Primary Data in 2017

Based on table 1, after statistical test of the effect of knowledge with workplace accidents in Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, it is known that the p value is 1.000. Based on the p value, there are no effect between knowledge with workplace accidents.

Table 2: The effects of worker characteristics with workplace accidents

Worker Characteristic	Workplace Accidents				Total		P value
	Never Happened		Happened				
	N	%	N	%	N	%	
Good	11	13,09	2	2,38	13	15,47	0,492
Almost Good	26	30,95	5	5,95	31	36,90	
Not Good	37	44,04	3	3,57	40	47,62	
Total	74	88,1	10	11,90	84	100	

Source: Primary Data in 2017

Based on table 2, after statistical test of the effect of worker characteristic with workplace accidents in Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, it is known that the p value is 0,492. Based on the p value, there are no effect between worker characteristic with workplace accidents.

Table 3: The effects of unsafe actions with workplace accidents

Unsafe Actions	Workplace Accidents				Total		P value
	Never Happened		Happened				
	N	%	N	%	N	%	
Safe	64	76,2	7	8,33	71	84,25	0,182
Almost Safe	10	11,90	3	3,57	13	15,47	
Not Safe	0	0	0	0	0	0	
Total	74	88,1	10	11,9	84	100	

Source: Primary Data in 2017

Based on table 3, after statistical test of the effect of unsafe actions with workplace accidents in Welding Section PT. Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, it is known that the p value is 0,182. Based on the p value, there are no effect between unsafe actions with workplace accidents.

Table 4: The effects of unsafe conditions with workplace accidents

Unsafe Conditions	Workplace Accidents				Total		Odds Ratio (CI 95%)	P value
	Never Happened		Happened					
	N	%	N	%	N	%		
Good	22	26,2	1	1,19	23	27,39	0,295 (0,104- 0,840)	0,030
Almost Good	51	60,71	7	8,33	58	69,04		
Not Good	1	1,19	2	2,38	3	3,57		
Total	74	88,1	10	11,9	84	100		

Source: Primary Data in 2017

Based on table 4, after statistical test of the effect of unsafe conditions with workplace accidents in Welding Section PT.Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java, it is known that the value of the odds ratio is 0.295 and p value is 0,030. Based on Odds Ratio, unsafe conditions have a risk of 0.295

times to cause work accidents. Based on p value, there are effects of the unsafe conditions with workplace accidents.

Workers in Welding Section PT.Suzuki Indomobil Motor Plant II-4W Tambun, Bekasi, West Java who have good knowledge and never have workplace accident as

many as 71 people (84.52%), workers who have almost good knowledge and never have workplace accidents as many as 3 people (3.57%), and workers who have good knowledge and have workplace accidents as many as 10 people (11.9%). According with the opinion of Shappel⁵ states that inadequate knowledge of the existence of risks and hazards and workplace accidents will make the worker do unsafe acts and harms his safety. They only know but not understand and apply it to a safe action. This condition will be more severe if the work environment is less supportive of the implementation of safe action at work⁶. According to L. Green⁷, behavior can be formed by three factors, one of which is the enabling factor, namely the availability of health facilities. Availability of personal protective equipment is one form of behavioral supporting factors. An automatic behavior has not materialized in an action if there are no facilities which support the formation of such behavior.

Workers who have good characteristic and never have workplace accidents as many as 11 people (13,09%), workers who have almost good characteristic and never have workplace accident as many as 26 people (30,95%), workers who have not good characteristic and never have workplace accident as many as 37 people (44.04%), workers who have good characteristic and have workplace accidents as many as 2 people (2.38%), workers who have almost good characteristics and have workplace accidents as many as 5 people (5.95%), and workers who have not good characteristic and have workplace accidents as much as 3 people (3,57%). Accidents are not only caused by work equipments, but also because of the tendency of the worker to be accident (accident proneness). "Accident proneness" is the fact that for certain workers there are signs of a tendency to have an accident. Research shows that 85% of the causes of small accidents are due to human factors^{8,9}.

This is not according with the WHO Study Group study which states that there is a corellation between age of the worker and the frequency of the occurrence of work accidents. Based on the Doewes study, it is known that the incidence rate of accidents is lower in older workers (45 years and over) than workers in younger ages (24 years and under) and prime age workers (25-44 years)¹⁰.

Workers' working period if associated with work experience can affect workplace accidents. Especially experience in terms of using various work equipments. More longer working period of workers, more experience will be gained and allowing the worker to work more safely¹¹. Experience is the whole that person gains from the occurrence they through, it means person experience can affect their behavior in the life of their organization. Therefore, more longer workers' working period life, more experience they get that making workers to work more safely¹¹.

Workers in Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W who have safe action and never have workplace accident as many as 64 people (76.2%), workers who have almost safe action and never have workplace accidents as many as 10 people (11.90%), workers who have safe action and have workplace accident of 7 people (8.33%), and workers who have unsafe action and have workplace accidents as many as 3 people (3.57%). The old concept in occupational safety management states that 85-96% of accidents are the result from unsafe acts or unsafe behavior. The results of research in quality control concluded that unsafe acts performed by workers is the result of a set of factors where management actually has control and responsibility to improve it. From that new concept, it is expected that the management tries to make a management system to improve workers behavior, and workers can work well according to standards¹².

Condition of personal protective equipment (PPE) in Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W is less flexible so that workers feel uncomfortable when using the PPE. Moreover, personal protective equipment is also not sufficient with the number of workers and the types of personal protective equipment is not complete as required. Personal protective equipment is not sufficient with the number of workers due to the delay of suppliers of PPE in delivery PPE, so that when workers want to take the PPE before starting work, the PPE is not yet available.

In the lighting aspect, it was found that the worker was tired of the eye muscle while working, workers claiming that the room light was uncomfortable, and the illumination of the electric lights when cloudy and at the evening was not enough. Based on secondary

data from lighting measurement in February 2016 there are 8 of 20 measurement points in Welding Section PT. Suzuki Indomobil Motor Plant Tambun II-4W still does not according with minimum lighting level from regulation of Health Minister Number 1405 concerning Health Requirements for Office and Industrial Work Environment that is 300 lux for routine job, on machine work and assembling. Measurements are made in February 2016 so that routine measurements should be made regularly to better known not sufficient lighting points and inadequate regulation.

In the noise aspect, it is found that workers concentration feel disturbed when working. Workers can understand what the other person said after paying attention to his lips movements, this indicates that some workers are degrading of hearing quality and will cause workplace accidents if workers fail to get danger warning information at work because they can not hear clearly. Secondary data from noise measurement on November 21, 2016 states that the noise in the area of Welding Center of Production Line about 82.3 dBA, Welding APV Line area about 80.76 dBA, and Welding Futura Line area about 76.5 dBA. All three measurement results are eligible Threshold Limit according with regulation of Health Minister.

Conclusion

Unsafe conditions which include the condition of personal protective equipment, lighting, and noise to workplace accidents can be concluded that there is a significant effect on workplace accidents with a p value = 0.030 and odds ratio of 0.295 which means workers who work in a work environment that is not safe has a chance of 0.295 times having a work accident compared to workers who work in a safe working environment.

Conflict of Interest Statement: The authors of this research declare that there is no conflict of interest related to this study

Source of Funding: All funds used to support this research come from the Ministry of Health, Health Polytechnic Institute II, Jakarta-Indonesia, Grant of Risbinakes Program

Ethical Clearance: The ethical clearance of this research taken from Ethics Committee of Health Polytechnic Institute II, Jakarta (Ethical Approval LB.02.01/KE/33/303a/2017)

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The Effect of Gelatinization Rice Storage on Body Fat Percentage and Short Chain Fatty Acids (Acetate) on Obesity

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Abstract

Background: Obesity is a problem in developed and developing countries that has a detrimental effect on health. Gelatinization rice that's stored hot or cold can increase resistant starch and short-chain fatty acids (SCFA) especially acetate (C2). Resistant starch contributes to decreasing glycemic index (IG) of rice and blood glucose levels, while acetate contributes to GLP-1 and PYY secretion which is related to appetite and decreased body fat. **Method:** The experimental study design was a pre-post controlled group design with 39 obese respondents divided into three randomized treatment groups (Control, P1, and P2). The research instrument was a measurement of body fat percentage and SCFA (*acetate*) levels blood plasma and statistically analyze with Saphiro Wilk and Paired t-test or Wilcoxon. **Results:** The analysis results of gelatinized rice storage were significant for body fat percentage ($p = 0.012 < 0.005$) and acetate ($p = 0.000 < 0.05$) in cold storage treatment of 4 °C for 24 hours (P2). **Conclusion:** Gelatinized rice which is kept cold at 4°C for 24 hours can reduce body fat percentage and increase acetate.

Keywords: Obesity, Gelatinization rice, Body fat percentage, Short-chain fatty acids, Acetate.

Introduction

Obesity is a physiological condition due to the excessive accumulation of body fat until it disrupts health¹. The regulation of rice diet can be a solution for obesity but rice consumption is still a problem because of its high glycemic index (GI)². GI rice can be derived through hot or cold storage to change the molecular structure of amylose-amylopectin to resistant starch (retro-gradation) until it's not easily digested³. Heat storage makes thereby reducing carbohydrate content⁴, While Cold storage causes retro-gradation until resistant starch^{5,6}.

Resistant starch is a starch fraction that's difficult to be hydrolyzed by amylase and passes into large intestine into a subtractive (*colonic food*) until it's fermented by micro-biota into SCFA especially acetate (C2)⁷.

Physiological properties of resistant starch are resistant to the amylase and slow release of glucose resulting in low energy intake and increase body fat breakdown^{8,9}. The contribution of acetate affects energy production through the secretion of hormones in intestine such as peptide-1 (GLP-1), glucagon, and peptide YY (PYY)¹⁰. Acetate can increase the secretion of PYY and GLP-1 which contributes to reducing energy intake and reducing body fat¹¹.

Method

Research design in this experiment is an experimental pre-posttest control group design and was carried out in Yogyakarta in October 2018. Sampling technique uses simple random sampling from affordable populations that met the criteria: healthy people, ages 18-58 years, BMI ≥ 25 kg / m², accustomed to eating rice, and have normal blood glucose levels. The minimum sample size was calculated 12 people were obtained in each group and added 10% to avoid drop out. Total samples size is 39 people and divided into three treatment groups randomly (K, P1, and P2). Control group (K) that's given gelatinized rice without storage, P1 that's given gelatinized rice stored hot at 70 °C (*rice cooker*) for 24

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hours, P2 that's given gelatinized rice which kept cold at 4°C (*refrigerator*) for 24 hours.

Gelatinized rice is IR64 milled rice cooked using a rice cooker (Yongma) at a temperature of 100 °C for 45 minutes with a water ratio of 1:2 measured using a food thermometer. Heat storage is a method of heat storage using a Yongma brand rice cooker at a stable temperature of 70-75 °C, measured using a food thermometer and a green on/off button indicator according to the specified time duration. Cold storage is a method of cold storage using a Fagor brand refrigerator at a stable temperature of 4 °C, measured using a hygrometer and an indicator of the engine temperature regulation for a specified duration of time.

The research procedure begins with subject screening and health examination. Then determining subjects if they meet the inclusion, exclusion criteria and are willing to fill in informed consent. Subjects were asked to take three days of diet program to consume 200

gr of gelatinized rice + 50 gr of fish + 240 ml of mineral water (morning, afternoon, and evening) in a single room and monitored. Data collection on day 1 at 07.00 in the morning after fasting for 8-10 hours was measured by body composition before breakfast. Day 2 and day 3 they were not measured, at day 4 their body composition was measured as on day 1 and 10 ml of blood was taken on 60 minutes after breakfast. Recall food intake for three days.

Primary data containing pre-post body fat percentage was carried out using BIA (*Bioelectric Impedance Analysis*) Amron HBF-375 Carada Scan brand, high blood plasma acetate levels carried out using VFA-GCMS method (*Volatile Fatty Acid - Gas Chromatography, Mass Spectrometry*), plasma blood sampling by Yogyakarta Parahita Diagnostic Center Laboratory and food recall is conducted three days with Nutrisurvey. Statistically analyzed using SPSS version 22 with Saphiro Wilk test and Paired t-test or Wilcoxon.

Results and Discussion

Table 1. Characteristics of Subjects

Variable	Value		
	K	P1	P2
n	13	12(1)	12(1)
Sex (Male/Female)	2(15.38%)/11(84.61%)	6(50%)/6(50%)	8(66.66%)/4(33.33%)
Age (year)	(27.92 ± 6.61)	(32.83 ± 7.17)	(31.67 ± 7.46)
IMT (kg/m ²)	(28.97 ± 2.92)	(28.74 ± 1.87)	(29.66 ± 4.81)
Energy intake (%)	90.60	97.21	95.95
Carbohydrate intake(%)	83.41	91.92	89.08
Fat intake (%)	93.60	94.08	92.26
Dietary fiber intake (%)	82.01	96.00	93.18

Table 1 shows the characteristics of the subjects based on their age, sex, BMI, and average intake of nutrients (energy, fat, carbohydrates, and fiber) during the diet program. Research subjects are employees who work in the hospital environment at RSPAU Dr. S. Hardjolukito until it has the same relative activity. The

number of subjects in each group was 13 people, but for the treatment groups P1 and P2 a drop out occurs one person from each group. The average nutrient analysis is relatively the same and meets the nutritional adequacy standard (RDA) for adults.

Table 2. Body Fat Percentage Pre and Post in Treatment Group

Group	Body fat percentage		Value	
	Pre Mean \pm SD	Post Mean \pm SD	%	p
K	33.03 \pm 3.50	34.45 \pm 3.70	0.95	0.166 > 0.05
P1	30.78 \pm 5.32	31.09 \pm 4.98	1.02	0.304 > 0.05
P2	32.66 \pm 5.16	31.00 \pm 5.24	-2.02	0.012 < 0.05

Table 2 shows the mean body fat percentage pre and post-treatment between control groups, P1, and P2 are decreased. The results of statistical analysis showed the mean body fat percentage pre (32.66 \pm 5.16) and post (31.00 \pm 5.24) P2 treatment group showed significant differences compared to the control group, this shows that administration of cold storage gelatinization of 4 °C for 24 hours ($p = 0.012 < 0.05$) had a significant effect on body fat percentage, while mean body fat percentage pre and post-treatment group P1 ($p = 0.304 > 0.05$) was not significantly different from the control group ($p = 0.166 > 0.05$). The average body fat percentage difference is illustrated in the following graph:

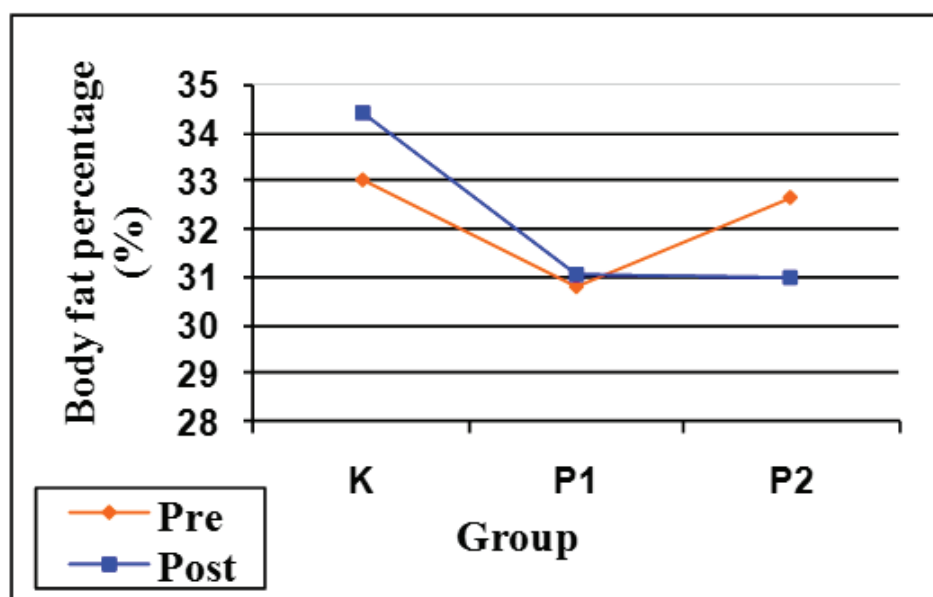


Figure 1. The differences between the effect of gelatinized rice storage on Pre and Post body fat percentage among treatment groups.

Gelatinization rice which is kept cold at 4 °C for 24 hours has been proven to significantly reduce body fat percentage by 2.02%, it's suspected that during cold storage a long decreased temperature can cause retro-gradation until it produces low digestibility and GI values and increases starch resistance¹². The mechanism of retro-gradation is re-binding of amylose-amylopectin molecules that come out of starch granules

that have broken due to a decreased temperature, forming microcrystalline webs and precipitates which are irreversible^{13,14}. Cold storage causes retro-gradation of amylose and amylopectin molecules into strong microcrystalline granules to become starch resistance, thus changing their physicochemical characteristics and digestibility¹⁵.

Body fat percentage reduction is thought to be a direct mechanism that's the physiological effect of resistant starch itself which affects the absorption of blood glucose and body fat¹⁶, while indirectly resistant starch will increase SCFA in the intestine which acts to stimulate hormones PYY and GLP-1 to slow down food absorption and increase energy breakdown¹². High content of resistant starch causes digestive process in the stomach and the rate of emptying the stomach to run slowly until the digestible food in stomach reaches the intestine slower, consequently the absorption of blood glucose in intestine occurs slowly until fluctuations in blood glucose are relatively small and increase energy expenditure^{3,17}. Resistant starch has a low GI and is difficult to digest by amylase, causing slow absorption which results in low blood glucose and increases body fat breakdown¹⁷.

Gelatinization rice is stored hot at 70 °C for 24 hours doesn't significantly reduce body fat percentage, although the average blood glucose level decreased, this is suspected of the increasing temperature for a long time cause oxidation occurs, carbohydrates are broken down into CO₂ and H₂O so carbohydrate content decreases, but doesn't reduce IG and its digestive value⁴. The effect of high temperature can increase the formation rate of hydrogen bonds of starch molecules with water to form a gel structure, but high temperatures also damage the bonds between starch molecules thereby increasing their digestible value^{13, 18}.

Table 3. Acetate Levels between Groups

Group	Mean ± SD	p
K	0.00 ± 0.00	0.000 < 0.05
P1	0.00 ± 0.00	
P2	0.34 ± 0.36	

Table 3 shows mean acetate levels in the P2 treatment group are increased, whereas in the Control and P1 treatment groups there was no increase (not detected). Statistical analysis showed significant differences in treatment group P2 (0.34 ± 0.36), but not significantly different in treatment group P1 (0.00 ± 0.00) compared to the control (0.00 ± 0.00), this shows that administration of cold storage gelatinized rice at 4 °C for 24 hours (p < 0.05) has a significant effect on acetate, The average

acetate level is illustrated in the following graph:

Figure 2. The effect of storing gelatinized rice on acetate among treatment groups.

Gelatinized rice which was kept cold at 4 °C for 24 hours was proven to significantly increase acetate 0.34 mMol, while the P1 treatment group was not detected (0). Acetate measurement results are still in the low category, it's suspected that the component of resistant starch in cold storage has not been formed optimally given the intervention program is only three days until the proportion of acetate formation is relatively small¹⁹. The mechanism of acetate formation is determined from resident starch fermented in the colon, while the role of microflora in the human digestive system requires a long time of adaptation to resistant starch until it can produce acetate and encourage the release of hormones GLP-1 and PYY²⁰. Absorption of acetate in the colon may vary until the location of fermentation and production of acetate greatly determines the circulating concentration of it in blood plasm²¹.

Gelatinized rice which stored hot at 70 °C for 24 hours doesn't increase acetate significantly; it's allegedly that hot storage cause carbohydrate oxidation until it doesn't produce starch resistant as raw ingredients for acetate establishment, other allegation said that it's because the amount of acetate circulate in plasma is too small until it can't be detected by tool's system. Hot storage mechanism for a long period will cause brownish coloration or Maillard reaction; a reaction that happened among carbohydrates with an amino acid as a result of heating²². Maillard reaction causes probiotic bacteria (BAL) difficult to grow when arrived at the colon, because there is a few sugar content that could be used by prebiotic bacteria for its growth, until acetate, as a product from the fermentation of resistant starch is not produced maximally^{22,23}.

Molecular mechanism of the parting of acetate allegedly through two pathways: first the G protein-coupled receptors (GPCRs) bind with micro-biota products that contribute to the regulation of food intake and fat formation¹¹; second, acetate binds to the enteroendocrine cell receptor, then it will secrete PYY, Glucagon, and GLP-1²³. GLP-1 and PYY secretion occurs in L cells located along the small intestine and large intestine, the numbers are increasing from

jejunum, ileum to the colon, and rectum¹¹. Glucagon works to maintain blood glucose levels in a state of fasting, while GLP-1 increases the ratio of insulin to glucagon which results in inhibition of hepatic glucose production until blood glucose levels decrease²⁴. PYY related to appetite regulation influences energy intake and expenditure through the hypothalamus and brain stem, low in concentration before eating, and increasing after eating²⁵. PYY will slow down food absorption and through the hypothalamus suppress hunger^{11,25}. Overall acetate affects PYY and GLP-1 to improve glucose homeostasis, increase energy expenditure, fat oxidation, and reduce lipolysis, thereby reducing body fat and body weight²⁶.

Conclusion

Cold storage in gelatinized rice has a significant effect on body fat percentage and acetate levels in obesity. Giving gelatinization rice that had been kept cold at 4 °C for 24 hours in the storage can reduce body fat percentage by 2.02% and increase blood plasma acetate 0.34 mMol.

Conflict of Interest; Nil

Source of Funding; Own

Ethical Clearance; Ethical clearance obtained from the Health Research Ethics Commissioner of RSUD dr. Muwardi Faculty of Medicine, Sebelas Maret University Surakarta, Indonesia, Number: 538 / IV / HREC / 2018.

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Factors Influencing Health Literacy of Students in Health Science Curriculum: A Cross-sectional Study

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Abstracts

Background: University students in health science curriculum are the future medical professionals responsible for promoting health literacy to the patients. Thus, it is important to study the level of health literacy in these students.

Purpose: This study aimed to examine the factors influencing the health literacy of students in health science curriculum.

Methods: In this cross-sectional study, a total of 270 undergraduate students in health science curriculum was selected using stratified sampling method. Data were analyzed using Chi-square test, Pearson's correlation coefficient, and Stepwise-multiple regression analysis.

Results: Findings showed that 64.4% of the students had a moderate level of health literacy. Based on the multiple regression model, the significant predictors of health literacy were social support (Beta= 0.441, t= 8.264, *p*-value <.001), policy to promote health perception (Beta= 0.186, t= 3.482, *p*-value <.001), family relationship (Beta= 0.154, t= -4.691, *p*-value <.001) and the GPA (Beta= 0.125, t= 2.246, *p*-value <.001). Together, these four factors could predict 38.0% of the variance in the health literacy of students in health science curriculum.

Conclusion: The health literacy of students could be improved by encouraging social support from family and community, strengthening health promotion policies, and promoting good academic performance. Moreover, given the moderate level of health literacy observed in health science students, it is recommended that universities should incorporate more health literacy topics in their curriculum.

Keywords: health literacy, students in health science curriculum, social support

Introduction

Health Literacy (HL) is the ability to gain access to, understand and use information in ways that promote

and maintain good health¹⁻³. In 1998, the World Health Organization defined health literacy as cognitive and social skills that determine an individual's motivation and ability to access, understand, and use the health information to promote and always maintain good health for oneself⁴. In other words, health literacy is the ability of a person to obtain health information from different media channels, and to understand and recognize the obtained health information and use this information to promote and maintain one's good health^{3,5}. Improving health literacy is important because it enables people to make informed choices about their health, and to take an active role in bringing about changes in the environments

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that shape their health ¹.

University students in health science curriculum are considered important human resources for national development ⁶. As future health professionals, they will be responsible for providing care to patients in all aspects - physically, mentally, emotionally, socially, spiritually, disease prevention and health promotion ^{7,8}. They also have to collaborate and coordinate with professional colleagues from different professions, including patients' relatives ⁹. It is therefore the responsibility of higher education institutions to produce graduates with advanced academic and practical knowledge ^{10,11} enabling them to become effective health professionals in the future that need to look after patients ¹².

Given the essential responsibility of health care professionals in the public health system, it is important to make sure that students have sufficient health literacy so they could educate patients to effectively take care of themselves. While these students take regular exams regarding anatomy and physiology, these are not sufficient to assess their knowledge of health literacy. Thus, there is a need to assess the health literacy level of undergraduate students in the health sciences curriculum in order to develop appropriate interventions in the curriculum depending on the outcome. Additionally, this will remind students of what they should know and will help professors in knowing which areas in health literacy they should focus on to achieve these goals. Therefore, the researcher will examine the factors influencing health literacy of students in health science curriculum.

Methods

In the study, a cross-sectional method was used to examine the factors influencing health literacy of students in health science curriculum.

Setting and Sample

This study was conducted at the College of Nursing and Health and College of Allied Health Sciences in a Thai university in the first semester of the academic year, April-May 2019. The researchers used G*power program to calculate the sample size using the following: a two-tailed hypothesis test, significance level of .05, and power of .80 which resulted in a sample size of 270 participants.

Ethical Consideration

The study was approved by the Ethics Committee of Suan Sunandha Rajabhat University and was carried out with written informed consent from the students. However, students who were not willing to participate could withdraw anytime.

Research Instruments

There were six instruments used in this study including: 1) demographic data consisted of 5 items, 2) family relationship; this instrument developed by Suksatan, et. al. ¹³ consisted of 12 items and the internal consistency by Cronbach's alpha coefficient was 0.80, 3) peer's relationship; consisted of 5 items and the internal consistency by Cronbach's alpha coefficient was 0.78, 4) social support, developed by Boonvarasatit, Homsin, Srisuriyawet ¹⁴ consisted of 16 items and the internal consistency by Cronbach's alpha coefficient was 0.90, 5) perceived health promotion policy consisted of 10 items and the internal consistency by Cronbach's alpha coefficient was 0.92, and 6) health literacy, this instrument developed by Nutbeam ¹ and Prabsangob ¹⁵ consisted of 14 items and the internal consistency of the questionnaire by Cronbach's alpha coefficient was 0.94.

Data collection

After obtaining their permission, students who met the inclusion criteria and agreed to participate were approached at the classroom for explanation about the study purpose and processes, receiving the information sheets and signing a consent form. Then, each student completed the questionnaires in around 10-20 minutes, without interruption during data gathering.

Data analysis

The researchers used descriptive statistics to describe the demographic characteristics of the participants. Pearson correlation coefficient was conducted to examine correlations of all health literacy variables and also used multiple regression analysis to examine the factors influencing health literacy of students in health science curriculum. The assumptions of multiple regression including normal distribution, multicollinearity, and heteroscedasticity ¹⁶ were examined and outliers were deleted for violating the assumptions.

Research Result

Characteristics of participants

In total, 270 undergraduate students in health science curriculum were investigated. Majority of the participants were female, 62.4%, the average age was 20.12 ± 0.241 years (Mean \pm SD), and the grade point average (GPA) was 2.86 ± 0.42 (Mean \pm SD). The largest percentage of participants were the students in the college of allied health sciences (53.8%), the majority of participants lived in the northeast region

(24.5%), and the majority of students earned an average monthly income from their parents were 156 - 312 US dollar (52.8 %).

Determinants of health literacy

The researchers found that 64.4% of participants have a moderate level of health literacy. In each category namely critical health literacy, interactive health literacy, and functional health literacy, the percentage of students with moderate levels of health literacy were 61.5, 60.3, and 57.8 percent respectively (Table 1).

Table 1: Number and percentage of health literacy of health science students (n = 270)

Health literacy	Mean	S.D.	n (%)		
			High	Moderate	Low
Functional health literacy	9.84	1.82	82 (30.3)	156 (57.8)	32 (11.9)
Interactive health literacy	18.78	3.45	79 (29.2)	163 (60.3)	28 (10.5)
Critical health literacy	14.62	2.67	88 (32.6)	166 (61.5)	16 (5.9)
Overall	39.02	7.23	74 (27.4)	174 (64.4)	22 (8.2)

The factors associated with health literacy

In terms of gender, college education, and the parenting styles of health science students, the researchers found that gender has a statistically significant relationship via Chi-square analysis (p -value = 0.024). However, parenting styles and college education have no relationship with health literacy.

The results of the analysis regarding the age, GPA, average monthly income, family relationships, social

support, and perceived health promotion policy of health science students, as analyzed by Pearson's Product Moment Correlation Coefficient, the authors found that GPA ($r = 0.142$), family relationships ($r = 0.360$), social support ($r = 0.224$) and perceived health promotion policies ($r = 0.302$) have a statistically significant relationship via Pearson's Product Moment Correlation Coefficient analysis (p -value < 0.05). However, age factor ($r = -0.106$) and average monthly income have no correlation with health literacy (Table 2).

Table 2: Summary of the Pearson's Product Moment Correlation Coefficient between individual factors, interpersonal factors, institutional factors, public policy level factors, and health literacy of health science students (n = 270)

Factors	Pearson's Product Moment Correlation Coefficient	p -value
Individual factors		
Age	-0.104	0.68
GPA	0.142	< 0.001*

Cont... Table 2: Summary of the Pearson's Product Moment Correlation Coefficient between individual factors, interpersonal factors, institutional factors, public policy level factors, and health literacy of health science students (n = 270)

Factors	Pearson's Product Moment Correlation Coefficient	p-value
Average monthly income	0.263	0.062
Interpersonal factors		
Family relationship	0.360	< 0.001*
Institutional factors		
Social support	0.224	< 0.001*
Public policy level factors		
Policy to promote health perception	0.302	< 0.001*

*Significant at p -value < 0.05

Prediction of intention

The factors influencing health literacy of health science students, were obtained through analysis between personal factors, interpersonal factors, institutional factors, and public policy level factors by Stepwise Multiple Regression. The researchers found that the four variables namely social support, policy to promote health perception, family relationship and GPA are significant predictors of health literacy based on their Beta values which are 0.441, 0.186, 0.154, 0.128 respectively. Overall, these variables can predict the health literacy of health science students by 38.0% (Table 3).

Table 3: Multiple correlation coefficient between predicted variables and health literacy of health science students by the stepwise multiple regression (n = 270)

Predicting factors	B	Beta	SE (b)	t	p-value
Social support	0.762	0.441	0.284	8.264	<0.001*
Policy to promote health perception	0.663	0.186	0.327	3.482	<0.001*
Family relationship	0.365	0.154	0.337	-4.691	<0.001*
GPA	-0.638	0.128	0.360	2.246	<0.001*
Constant = 70.230					

*significant at p -value < .001, $R^2 = 0.380$

Discussion

This study applied the theoretical framework of the social ecological model for predicting the factors influencing health literacy of students in health science curriculum. Results indicated that 38.0% of the variance in health literacy can be predicted and explained by the four variables which are social support, policy to promote

health perception, family relationship, and GPA. The most predictive factors in health literacy were social support, such as peers, family, and professors, which enable students to manage themselves more healthily^{17,18}. The findings are consistent with that of Parashar¹⁹ who found that living together with people with good health and sufficient intelligence would help support

that person to be healthy. In addition, these results also closely corroborate with that of Kara Kaşıkçı, Alberto²⁰ who found that social support from family members, friends and health personnel such as physical, emotional, informational, and counseling support were correlated with health literacy. The researchers found that perceived health promotion policy is correlated with health literacy. This factor can predict students' health literacy because it enables them to recognize that government policies for adolescent development is very important. Moreover, the students who are continuously supported by their families, peers, and professors are likely to have good awareness. In fact, Noonil, Aekwarangkoon²¹ found that children and youths who are actively participating in school and community activities tend to have positive life assets.

Results showed that family relationships were the third factor that can predict the health literacy of students in the health sciences curriculum. The findings agree with that of Begoray, Wharf-Higgins, MacDonald²² who found that having good family relationships leads to good health outcomes. In addition, it will lead to self-management as well²³ while the support provided by health personnel has little effect on oneself^{24,25}. Moreover, GPA is also an important predictor of health literacy. Since GPA is an indicator of the students' academic performance, this also correlates to their ability to acquire health literacy. In fact, Jaiboon et. al.²⁶ studied 174 students and they found that students with very good grades were knowledgeable, interested in learning, and always diligent in seeking new knowledge, which makes the children in these group have more health disputes regarding reading than children with low and moderate grades has statistical significance at p -value .05²⁷. According to Aunprom-Me and Aunprom-Me²⁸, there is a positive correlation ($r = .278$, p -value = .006) between GPA in their study of 98 fourth year nursing students.

Conclusion

This study provides evidence that social support, policy to promote health perception, family relationship, and GPA are important factors that determine the health literacy of students in health science curriculum. Therefore, healthcare providers, families, and professors should consider these factors in developing interventions

to promote the health literacy of students in health science curriculum. Interestingly, we found that the majority of the university students in health science programs have only a moderate level of health literacy. This suggests that universities should incorporate more health literacy topics in their curriculum. It is also likely that students in another profession such as engineering, arts, business and social sciences would have a relatively lower health literacy. Thus, it is recommended that universities should incorporate health literacy in their curriculums as well.

Acknowledgment: The researchers would like to thank all participants for their involvement and also Ruel Cedeno for the fruitful discussions.

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

Funding statement: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. No additional information is available for this paper.

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Determinants of Intention to Use Medical Cannabis among People in the Northeast of Thailand

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Abstract

Background: Despite has been illegal in many counties, cannabis is the most frequently used illicit drug worldwide. The legalization of medical cannabis (MC) in Thailand has just been effective in 2019, resulted in increasing demand for MC use of which many are inappropriate use. Therefore, this study aimed to describe the current situation of intention to use medical cannabis and identify factors associated with MC demand in the Northeast of Thailand.

Method: This analytical cross-sectional study administered a multistage random sampling to select 1,273 peoples in the Northeast of Thailand. Data were collected by using a self-administered structured questionnaire. Multiple logistic regression analysis was used to identify the determinants of intention to use MC among people in the Northeast of Thailand, presented adjusted odds ratio, 95% confidence interval, and p-values.

Result: The results indicated that most of the respondents had intention to use MC (75.81%). The factors that were significantly associated with intention to use MC included; had good to very good levels of attitude toward MC (adj.OR = 3.74; 95%CI: 2.77-5.04), ever received information on MC (adj.OR = 2.16; 95%CI: 1.59-2.94), lived in urban areas (adj.OR = 1.90; 95%CI: 1.40-2.57), had sufficient and excellent levels of health literacy in understanding information on MC (adj.OR = 1.56; 95%CI: 1.18-2.06) and had low and average levels of knowledge concerning MC (adj.OR = 1.51; 95%CI: 1.12-2.05) when controlling other covariates.

Conclusion: Most of the people in the Northeast region had intention to use MC. Attitude, knowledge, health literacy, acquiring information and residential setting had influence on intention to use MC.

Keywords: Cannabis, Intention to use, Marijuana, Medical cannabis use

Introduction

Cannabis is the most frequently used illicit drug worldwide¹ and is one of the world oldest herbal plants with a long history of use as medicine in both Eastern and Western medicines². In 1850, cannabis extracts were once listed in the US Pharmacopeia but had been

removed in 1942 because of reported as causing users lost consciousness, hallucinations and commit crimes. Thereafter, cannabis has been banned to be used as medicine worldwide by WHO³ and has been classified as substance drugs by the United Nations since then. However, cannabis has been used clinically once again recently. The first country to legalize medical cannabis (MC) in 1970 was the United States, followed by Canada in 1999⁴. At present, cannabis has been reported widely used worldwide.⁵ However, most countries allow cannabis for medical use only, very few countries that people can use cannabis for recreational purposes.

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In Thailand, the legalization of cannabis use has just been effective since February 2019, with permitting the use for medical purposes only. Public interest in MC use is increasing rapidly after the change. Only three months after the change, there were reports of cannabis overdose leading to many hospitalizations and some died with steadily increased number of patients⁶. These are evidence that the problem of cannabis use is just starting.

Previous studies reported that demographic characteristics and risk behaviors were associated with cannabis use.⁹ Males in Asia used cannabis about 1.49 times more than females, and 51.5% of cannabis users were those with separate marital status. Tobacco use increased cannabis use among males, whereas alcohol use increased cannabis use in females. In addition, depressed mood increased cannabis uses about 2 times. Knowledge was related to herbal medicine use, especially among females. Sex, age, education had influence on attitude concerning herbal medicine, of which females believed more than males^{18,20}. Moreover, some studies observed that demographics⁸, socioeconomic^{7,9} and health literacy¹⁰ were related with alternative and herbal medicine use.

However, the study on cannabis use in Thai people, especially cannabis for medical use is limited, probably its newly legalization in the country. In addition, little is known in the Northeast, the biggest region both in term of areas and population but having the lowest socioeconomic status. Therefore, understanding the intention to use cannabis for medical propose as well as its associated factors is essential to properly minimize the profit and minimize the adverse impacts related to MC. Therefore, the aim of this study was to determine situation of intention to use cannabis for medical purposes and identify factors associated with intention to use MC in the Northeast of Thailand.

Material and Method

Study design

This cross-sectional study was conducted in 2019. The population was people aged 18 to 59 years old who lived in the Northeast of Thailand. The sample size was calculated using the sample size estimation formula for logistic regression analysis of Hsieh¹¹. The estimated

sample size was 1,273 samples. A multi-stage random sampling method was used to recruit samples from four provinces of the Northeast of Thailand. A self-administered structured questionnaire was developed based on research questions and relevant literature. The questionnaire was test by 5 experts for validity. The Cronbach's alpha coefficient of the questionnaire was 0.87.

Data Analysis

A simple logistic regression was used to identify association between each individual independent variable and intention to use MC. The independent factors that had p-value smaller than 0.25¹² were processed to the multivariable analysis using a multiple logistic regression to identify factors associated with intention to use MC when controlling the effect of other covariates. The magnitude of effect was presented as adjusted odds ratio (Adj.OR), 95% confidence interval (CI) and p-value <0.05 as statistically significant level.

Results

Among a total of 1,273 respondents. Most respondents were female (55.15%) with the average age of 35.25±13.98 years old. Majority lived in rural areas (64.02%), 53.73% finished primary school or lower, and 58.44% were married. The highest proportion worked in agricultural sectors (48.23%) and 18.77% were factory employees. Their median monthly income was 10,000 baht, 15.48 % were overweight and 29.46 % were obese. Most of them were drinkers (66.85%) and 17.67% were smokers. More than half had chronic diseases (51.06%). All of them had health insurance of which 51.69% were under the universal coverage scheme.

Most of the respondents ever received information about cannabis. As high as 42.81% had experience using cannabis. Most of them agreed with legalization cannabis in Thailand, and 63.23% agreed with using cannabis for medical purposes with proper control measured. The media that the respondents received information about MC were mostly social media, online media, television and from medical staff. Almost one-third had low levels of knowledge about MC use. However, 52.24% had good attitude toward MC use. Concerning health literacy, 44.54% had problematic levels of health literacy toward MC when divided into four components found that

39.28% had problematic level of access to information, 41.48% had sufficient level of understand information on MC, 39.36% had sufficient levels of appraisal information on MC and 38.34% had problematic level of applying information into practices. (Table 1)

Table 1. Information, Health literacy, knowledge and attitude towards medical cannabis (MC) use among people in the Northeast of Thailand. (n=1,273)

Factors	Number	Percent
Ever received information about cannabis		
No	295	23.17
Yes	978	76.83
Experience in using cannabis		
No	728	57.19
Yes	545	42.81
Smoke	415	36.60
Food	282	22.15
Treatment	29	2.28
Opinion about legalization cannabis		
No comment	253	19.87
Agree with legalization cannabis	987	77.53
Support for medical use only	805	63.23
Support cannabis use freely	182	14.30
Disagree with legalization cannabis	33	2.59
Media that most received about MC		
Social media (line, Facebook, Instagram)	716	56.25
Online media (website, google, YouTube)	225	17.67
Television	114	8.96
Doctor, pharmacist and medical staff	97	7.62
Academic article	38	2.99
Training course/ Conference	35	2.75
Application on mobile phone	17	1.34
Newspaper	10	0.79
Other (parents, teacher, radio, brochures)	21	1.65

Cont... Table 1. Information, Health literacy, knowledge and attitude towards medical cannabis (MC) use among people in the Northeast of Thailand. (n=1,273)

Health literacy about MC		
Inadequate	206	16.18
Problematic	567	44.54
Sufficient	425	33.39
Excellent	75	5.89
Knowledge about MC		
Low	442	34.72
Average	217	17.05
Good	236	18.54
Very good	378	29.69
Attitude towards MC		
Poor	26	2.04
fair	508	39.91
Good	665	52.24
Very good	74	5.81

Concerning the intention to use MC, as high as 75.81% (95%CI 73.35 to 78.13) had intention to use MC. The reasons for intention to use MC were; to promote sleep, relieve pain and chronic pain, cure cancer, anti-anxiety and stimulate appetite respectively. (Table 2)

Table 2. Intention and reasons to use medical cannabis (MC) among people in the Northeast of Thailand (n=1,273)

Factors	Number	Percent	95% CI
Intention to use MC			
No	308	24.19	21.86 to 26.64
Yes	965	75.81	73.35 to 78.13
Reasons for intention to use MC			
Promote sleep	767	60.25	57.50 to 62.95
Relieve pain and chronic pain	651	51.14	48.35 to 53.92
Cure cancer	600	47.13	44.36 to 49.92

Cont... Table 2. Intention and reasons to use medical cannabis (MC) among people in the Northeast of Thailand (n=1,273)

Anti-anxiety	595	46.74	43.97 to 49.52
Stimulate appetite	557	43.75	41.01 to 46.53
Cure epilepsy	241	18.93	16.81 to 21.19
Treat Alzheimer	224	17.60	15.54 to 19.80
Treat nausea and vomit	152	11.94	10.21 to 13.85
Treat skin disease	131	10.29	8.67 to 12.09
Treat glaucoma	114	8.96	7.44 to 10.66

The multivariable analysis using multiple logistic regression with backward elimination indicated that the factors significantly associated with intention to use MC were: had good to very good levels of attitude on MC use (adj. OR = 3.74; 95%CI: 2.77 to 5.04), ever received cannabis information (adj. OR = 2.16; 95%CI: 1.59 to 2.94), lived in urban areas (adj. OR = 1.90; 95%CI: 1.40 to 2.57), had sufficient to excellent levels of health literacy in understanding information on MC (adj. OR = 1.56; 95%CI: 1.18 to 2.06) and had low to average levels of knowledge on MC use (adj. OR = 1.51; 95%CI: 1.12 to 2.05) when controlling other covariates. (Table 3)

Table 3. The multivariable analysis of factors associated with intention to use medical cannabis (MC) among people in the Northeast of Thailand. (n=1,273)

Factors	Number	% Intention to use MC	Crude OR	Adjusted OR	95% CI	p-value
Attitude toward MC use						< 0.001
Low to fair	534	60.86	1	1		
Good to very good	739	96.60	4.16	3.74	2.77 to 5.04	
Ever received information about cannabis						< 0.001
No	295	64.07	1	1		
Yes	978	79.35	2.15	2.16	1.59 to 2.94	
Residential area						< 0.001
Rural	815	72.64	1	1		
Urban	458	81.44	1.65	1.90	1.40 to 2.57	
Health literacy in understanding information						0.002
Insufficient/ Problematic	555	70.81	1	1		
Sufficient/ Excellent	718	79.67	1.61	1.56	1.18 to 2.06	
Knowledge on MC use						0.007
Good to very good	614	68.73	1	1		
Low to average	659	82.40	2.12	1.51	1.12 to 2.05	

Discussion

Most people in the Northeast of Thailand had intention to use MC. This finding was similar to previous studies conducted in Thailand^{13,21} reported that 71.71% of the respondents aims to use MC. It might be that the country just legalize MC use last year. It is a new issue with widely distributed topics nationwide, therefore it increases awareness and demand for use. The reasons for intention to use MC including to promote sleep, relieve pain, cure cancer, anti-anxiety and stimulate appetite. It was similar with the poll conducted in Thailand²² reported that people will use cannabis to relieve pain, insomnia, cancer and reduce depression. It indicated the perspective of general people that they would use cannabis for relief some symptom but for treating of diseases, it still depended on doctor.

After controlling the covariates with backward elimination in the multivariate analysis, five variables were significantly associated with intention to use MC in the Northeast of Thailand were; attitude toward MC, received information about cannabis, residential areas, and health literacy in understanding and level of knowledge on MC. People with good to very good levels of attitudes toward MC were 3.74 times more likely to intention to use MC when compared with those with poor to fair levels. It was similar with a study conducted in Saudi Arabia¹⁴, reported that positive attitude had effect on selection to use alternative medicine. Those who received information about cannabis were 2.16 times more likely to have intention to use MC when compared with those never received any information which was similar with a study conducted in Thailand¹⁵. It might be that receiving information will make them beliefs in benefits of MC which increased their interests to use it. People who lived urban areas were 1.90 times more likely to have intention to use MC. This finding was contrast with a study conducted in Turkey¹⁶, probably because of the difference in level of knowledge and access to health information. Those who had sufficient to excellent levels of health literacy in understanding information were 1.56 times more likely to have intention to use MC when compared with those with insufficient and problematic levels. It was similar with a study in the United States¹⁷. The possible explanation was that if they understand information on MC, they will have more confidence to use it. Had low to average levels of knowledge about MC

use were 1.51 times more likely to have intention to use MC when compared with those with good to very good levels. It might be they did not have enough knowledge on MC in all aspects, but having good attitude, therefore increasing their demand to use MC. This finding was contrast with a study conducted in Ethiopia¹⁸.

Conclusion

The study indicated that 75 percent of people in the Northeast of Thailand have intention to use MC. The significant associated factors with intention to use MC are had good and very good attitude on MC, received cannabis information, sufficient and excellent levels of health literacy in understanding information, urban residents, and low to average levels of knowledge on MC when controlling other covariates. Relevant sectors should strengthen information distribution and implement effective measures to improve health literacy. Special attentions should be for those in urban settings.

Acknowledgement

The authors would like to express our sincere appreciation to respondents times and information. Special thanks to the Faculty of Public Health, Khon Kaen University, Khon Kaen University, Thailand for the supports.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE622247.

Source of Funding- Self-funding.

Conflict of Interest- Without.

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Health Literacy and Dietary Supplement Consumption among Northerners of Thailand

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Abstract

Background: Dietary supplement consumption have been widely used worldwide including Thailand aiming at improving or maintaining health. This research aimed to describe the patterns and identify the association between health literacy and dietary supplement consumption in the Northeast of Thailand.

Method: This cross-sectional study was conducted among 1,200 persons, aged 18 or older, who were multistage random sampling from four provinces of the Northeast of Thailand to response to a structured questionnaire interview. The multiple logistic regression was performed to identify the influence of health literacy on dietary supplement consumption among people in the Northeast of Thailand when controlling the covariates.

Result: Among the total of 1,200 participants, 76.10% (95%CI: 73.42-78.78) were currently consuming dietary supplement. Factors that were associated with dietary supplement consumption were; had sufficient to excellent level of health literacy on appraising health information (adj.OR= 1.97; 95%CI: 1.30-2.99), had sufficient to excellent level of health literacy on accessing to health information (adj.OR= 1.91; 95%CI: 1.28-2.86), had chronic disease (adj.OR= 2.45; 95%CI: 1.74-3.44), had low level of knowledge on dietary supplement (adj.OR= 2.13; 95%CI: 1.38 -3.27), were males (adj. OR= 2.11; 95%CI: 1.65 -2.69), dissatisfied with self-body image (adj.OR= 1.50; 95%CI: 1.13 -1.98), married (adj.OR= 1.49; 95%CI: 1.16 -1.92), had insomnia (adj.OR = 1.48; 95%CI: 1.15 -1.98), when controlling other covariates including age, income, education, occupation, chronic health, health expenditure and physical activities.

Conclusion: Most of the population in the Northeast of Thailand consumed dietary supplement. Health literacy in accessing and appraising health information as well as health status were associated with dietary consumption. Enhancing the health literacy and knowledge on dietary supplement were essential.

Key words: *dietary supplement consumption, health literacy, Northeast of Thailand*

Introduction

Rapid economic growth speedily effected on the behavior of people around the world to work hurry, which lead to change the health behaviors¹. Dietary supplements are products taken by mouth that contain dietary ingredients include vitamins, minerals, amino acids, and herbs or botanicals, as well as other

substances that can be used to supplement the diet². Careless of the food consumption can make people lack nutrient. There are annually increasing patients with chronic diseases which caused by eating habits³. Each year, 15 million people between the ages of 30 and 69 years die from a NCDs; over 85% of these “premature” deaths occurs in low- and middle-income countries. Children, adults and the elderly are all vulnerable to the risk factors contributing to NCDs, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the harmful use of alcohol⁴. Therefore, dietary supplement products have become an essential role for

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all groups who turn to choose food supplements as food regular consumption since the belief that it has enough nutrient for body need. Many of the cases they were compiled in food supplements as well as according to the advertisement from the supplement manufacturing company which overstated that it can help made the body strong or could accelerate energy metabolism without exercise^{5,6}.

Health literacy is linked to the ability of individuals to understand and apply health information to practice for disease prevention and health promotion⁷. People with low level of health literacy should be more likely to have lower accessing health information, health care, self-preventing and treatments. As the result, the decision to select health care methods would regardless of academic principles^{8,9}.

The Northeast region of Thailand is the biggest region both in term of areas and population and had the second highest labor forces in the country. These population work under the rush conditions, being in stress, lacking attention to health care, and eating unhealthy food which might increase their dietary supplement consumption^{10,11}. At present there is no comprehensive study on dietary supplement consumption patterns of the people in the Northeast of Thailand as well as factors influencing the consumption especially the health literacy. The objective of this study was to describe the patterns and identify the and health dietary supplement consumption among people in the Northeast of Thailand when controlling other covariates.

Material And Method

Study Design

This cross-sectional study was conducted among 1,200 people aged 18 or older who were recruited by using a multistage random sampling from four provinces of the Northeast of Thailand including Mahasarakham, Chaiyaphum, Udon Thani, and Ubon Ratchathani provinces with proportional to size of the population. The inclusion criteria were aged 18 and older, lived in Northeast of Thailand during the data collection and agreed to participate. The people who were critically ill were excluded from this study. A self-administered

structured questionnaire was used for data collection. The questionnaire includes social-demographic, health status, health care, dietary supplement consumption, marketing, mental health, self-efficacy, health literacy and knowledge on dietary supplement information.

Data Analysis

Descriptive statistics including frequency and percentage were used to describe categorical data whereas mean, standard deviation, median, and maximum minimum were for continuous data. A simple logistic regression was used to identify association of each independent variable with dietary supplement consumption. The independent factors that had $p\text{-value} < 0.25$ were processed to a multivariable analysis using logistic regressions to identify the association between health literacy and health dietary supplement consumption when controlling the other covariates. The magnitude of association was presented as adjusted odds ratio (adj.OR), 95% confidence interval (CI) and $p\text{-value} < 0.05$ was a statistically significant level.

Results

Among the total of 1,200 participants, 50.05% were males with the average age of 41.97 ± 17.07 years old. The highest proportion finished only primary school (33.92%) followed by high school (26.17%). Most of them were married (60.25%), 28.42% were in agricultural sectors, followed by freelance job (18.42%). Their median monthly income was 60,000 (500:12,000,000) Baht. As high as 43.0% were overweight or obesity and 22.67% had chronic diseases such as hypertension and diabetes. Most of them report rarely or did not exercise at all (70.42%). Only 44.7% perceived of having good health. Most of these North easterners ever consumed dietary supplement (81.25%) during the past 3 months, of which 76.10% were current consumers. Among the current users, 56.33% consumed dietary supplement for promoting health, followed by beauty dietary supplement (12.17%) and dietary supplement for disease prevention and treatment (9.58%) (Table1).

Table1: Dietary supplement consumption behaviors among the Northerners of Thailand (n=1,200)

Dietary supplement consumption	Number	Percentage	95%CI
Dietary supplement consumed during the last the last 3months (1,200)			
Never consumed	225	18.75	17.90-18.34
Ever consume	975	81.25	78.92-83.42
Currently consuming dietary supplement (975)			
Stop consumption	233	23.89	21.21-26.57
Currently consume	742	76.10	73.42-78.78
Type of Dietary supplement consumed			
Did not consume	225	18.75	16.57-21.07
Dietary supplement for promoting health	676	56.33	53.47-59.16
Beauty dietary supplement	146	12.17	10.36-14.15
Dietary supplement for disease prevention and treatment	115	9.58	7.97-11.39
Weight control dietary supplement	38	3.17	2.25-4.32

Health literacy covered the access to health information, understanding, appraising and making decision on health information and practices. It was found that more than half had inadequate or problematic levels of health literacy (57.35%), 35.92% had sufficient level of health literacy and only 6.83% had excellence level of health literacy (Table2).

Table2: Health Literacy level among the Northerners of Thailand (n=1,200)

Health literacy level	Number	Percentage	95%CI
Inadequate (0 - 25 points)	189	15.75	13.73-17.93
Problematic (26 - 33 points)	498	41.50	38.69-44.34
Sufficient (34 - 42 points)	431	35.92	33.19-38.70
Excellent (More than 43 points)	82	6.83	5.47-8.41

The multiple logistic regression indicated health literacy was associated with dietary supplement consumption among the North-easterners as well as other covariates. Factors that were associated with dietary supplement

consumption among the North-easterners were; had sufficient to excellent levels of health literacy on appraising on health information (adj.OR= 1.97; 95%CI: 1.30- 2.99), had sufficient to excellent levels of health literacy on accessing to health information (adj. OR= 1.91; 95%CI: 1.28-2.86), had no chronic disease (adj.OR= 2.45; 95%CI: 1.74 -3.44), had low level knowledge on dietary supplementary (adj.OR= 2.13; 95%CI: 1.38 -3.27), male (adj.OR= 2.11; 95%CI: 1.65-

2.69), dissatisfied with self-body image (adj.OR= 1.50; 95%CI: 1.13 -1.98), married (adj.OR= 1.49; 95%CI: 1.16-1.92), had insomnia (adj.OR= 1.48; 95%CI: 1.15- 1.98) and was a younger elderly (60-69 years old) (adj. OR= 1.84; 95%CI: 1.37-2.47) when controlling other factors including age, income, education, occupation , chronic health, ealth expenditure, physical activities (Table 3).

Table 3: Multivariable analysis of factors associated with dietary supplement consumption among the Northeasterners of Thailand, by using the multiple logistic regression presenting odds ratios, adjusted odds ratios, 95%CI and P-value (n=1,200)

Factors	Number	% of Use	Crude OR	Adj. OR	95% CI	p-value
Health literacy: Appraising health information						0.002
Sufficient /Excellent	189	55.03	1	1		
Inadequate/ Problematic	1011	56.58	1.06	1.97	1.30 - 2.99	
Health literacy: Accessing to health information						0.002
Sufficient /Excellent	988	54.45	1	1		
Inadequate/ Problematic	212	65.09	1.55	1.91	1.28 - 2.86	
Chronic Disease						<0.001
No	969	52.01	1	1		
Yes	231	74.46	2.68	2.45	1.74- 3.44	
Knowledge on dietary supplements						0.001
Fair/good	1146	55.58	1	1		
low	54	72.22	2.07	2.13	1.38 - 3.27	
Gender						<0.001
Female	599	47.41	1	1		
Male	601	62.22	2.08	2.11	1.65 -2.69	
Satisfaction (on self-body image)						0.001
Yes	310	49.03	1	1		
No	890	58.88	1.48	1.50	1.13 - 1.98	
Marital Status						0.002
Single	477	48.64	1	1		
Married	723	61.41	1.68	1.49	1.16 -1.92	
Insomnia						0.001
No	660	51.52	1	1		
Yes	540	62.22	1.55	1.48	1.15 - 1.89	

Discussion

The consumption of dietary supplement of the people in the Northeast of Thailand during the last three months was as high as 81.25%, of which 76.10% were current consumers of dietary supplement. Moreover, among currently consumers 56.33% consumed them to promote health. These findings were in line with the results of other studies on dietary supplementary which reported that 48 to 53% were regular supplement users¹⁰. A study in Denmark reported that 71 % of the Danes were dietary supplement users¹². Moreover, among 1,113 respondents on a survey, 57% used supplements or vitamins for specified reason to prevent health concerns¹³. The possible reasons that could explain these situations where the dietary supplement products which were mostly consumed were considered as having higher nutrients which could boost up the energy and promoting health. These dietary supplements included energy drinks, minerals, essence of chicken extraction, bird's nest extract. Since Thailand has entered an aging society, population is declining, and most people are becoming more concerned on health. According to a survey, more than 89% of consumers want to buy healthy food and beverages, and in the middle-income group, buying products is based on quality rather than price¹⁴.

This study observed that having adequate to excellent levels of health literacy in terms of accessing to and appraising health information had influence on dietary supplement consumption. It was similar with the result from other studies which showed that the elderly with the ability to make health decisions at a high level had chances to have good quality of life^{8, 9}. It seems to be due to well access to adequate health information then understanding about health, needs for health services and making decision to select the appropriate nutritional supplement for health were most practices.

Having chronic disease among adults was associated with dietary supplement consumption. People with chronic diseases tend to use dietary supplement than those who are healthy. As many of them searching for alternative cares than normal people. This result was in line with the finding from a previous study which reported that people with chronic illness were 2.05 times more likely to use herbs for primary health care

than those without underlying diseases¹⁵. The similarity of finding expressed that medication prescription users with menopause and chronic gastrointestinal disorders had the highest rates of non-vitamin dietary supplement use^{16, 17}.

Low level of knowledge on dietary supplements had influences on dietary supplement consumption. Some studies found that among public health personnel who had low level of knowledge on supplement product, were high products consumption¹⁸ which was considered as a serious health risk or getting higher risk for side effects due to inappropriate product consumption¹⁹. In addition, some studies showed that people who are knowledgeable about food and health related food, were more likely to use dietary supplements²⁰.

Males were more likely to use dietary supplements. This finding was similar with a study which found that males tend to use herbal supplements as botanical used more than females²¹. On their studied with reported contrast results with this study that females was more likely to be users of any dietary supplements^{10-12, 16}. It may be that our study was more focus with dietary supplement which related to health whereas others they studied in general. In addition, the participants of this study were from sectors it should represent the populations of the region.

Conclusion

Most of the Northeasterners of Thailand were current dietary supplement consumers. Health literacy on accessing on and appraising health, health status, knowledge, gender and ages had influence on dietary supplement consumption of the participants. Enhancing the health literacy as well as knowledge on dietary supplement and health are especially among males, and elderly.

Acknowledgement

We would like to express our sincere appreciation to all participants as well as the Research and Training Center for Enhancing Quality of Life for Working Age People, and the Faculty of Public Health Khon Kaen University, Khon Kaen, Thailand for the support.

Ethical Clearance- Taken from the Ethics Committee of Khon Kaen University, based on the

Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE HE622014.

Source of Funding- Self-Funding.

Conflict of Interest- Without

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Comparison of Zinc Level In Mother With Postpartum Blues and Normal at Makassar City

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Abstract

Introduction : Postpartum blues is a mild mood disorder that is temporary, characterized by short tears, feelings of loneliness or rejection, anxiety, confusion, forgetfulness and insomnia. The causes can occur in the form of biological and social factors. Postpartum blues is a type of depression commonly found in mothers. Zinc is a biological factor that is thought to be related to the incidence of depression in mothers

Objectives: This study aims to look at zinc levels in mothers with postpartum blues when compared with normal mothers

Methods: This research was conducted at St. Fatimah Hospital in Makassar. This type of research is analytic study with cross sectional design. The population of this study was all mothers who were treated at St. Fatimah Hospital for the period of May-June 2017 that were selected by purposive sampling. Based on established criteria, 68 postpartum mothers were chosen. Depression scores were collected using the Edinburg Postnatal Depression Scale. Level of zinc was examined through the colorimetric method using QuantiChrom Zink Assay Kit (DIZN-250). To determine the differences in zinc levels used independent t test.

Results: This study found that zinc levels in mothers with postpartum blues were higher when compared to normal mothers. The difference is 1.74 µg / dl. But the difference was not significant (p = 0.263). Most mothers with postpartum blues have low zinc levels (66.7%) whereas those normal mother mostly have very low zinc levels (50%). But the difference was not significant (p = 0.170)

Conclusion: This study found no significant differences in zinc levels in mother with postpartum blues or normal. But an important finding is the low levels of zinc in postpartum mothers in Makassar City. This is important to get attention because zinc plays an important role in the health of mother and child

Keywords : blues, depression, mother, postpartum, zinc

Introduction

Postpartum blues are transient mood disorders that occur on the first day to the 10th day after childbirth which are characterized by brief cries, feelings of

loneliness or rejection, anxiety, confusion, forgetfulness and insomnia¹

Mothers with postpartum blues have symptoms such as easy to cry, moody, sadness, anxiety, mood changes, irritability, lack of concentration and forgetfulness¹. But there is also a mention that the signs and symptoms of postpartum blues include tearfulness, emotional lability, mood changes, confusion, anxiety and cognitive impairment²

There are 2 hypotheses that can explain the occurrence of postpartum blues. First, hormonal changes. Evidence that supports this includes findings about absolute levels

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of the hormones estrogen and progesterone not related to postpartum blues, but large changes in hormones related to pregnancy and childbirth that cause postpartum blues. In addition, the progesterone metabolite yield, allopregnanolone, an agonist of α -aminobutyric acid is significantly lower in mother with postpartum blues. The second hypothesis, is that postpartum blues occurs due to activation of the biological system under parenting and maternal behavior, which is mainly regulated by the hormone oxytocin. There is direct evidence of this effect in nonprimate mammals³

Zinc is a metal group IIB with a molecular weight of 65.4. Zinc is a catalytic metal ion that is most often found in the cytoplasm of cells. Adult humans have zinc contents between 1.2 and 2.3 g which are distributed in all tissues⁴

Lots of evidence shows that zinc has a relationship with the incidence of depress⁵. Apart from dealing with depression in general, zinc also plays a role in the occurrence of Postpartum Depression in mothers⁶. Wojcik et al. conducted a cohort study of 66 women given zinc supplementation. The zinc serum is then examined at three time points, namely one month before giving birth, 3 days and 30 days after giving birth. The results show that zinc levels are related to the severity of depressive symptoms in women with postpartum depression⁷

Studies related to zinc conducted in Indonesia, still no one has seen the role of zinc in depression, especially postpartum blues. In fact, the data about zinc levels in post partum mothers do not appear to be available. Though based on the review that has been done, most studies support the role of zinc in the incidence of depression. So there needs to be a study of the relationship of zinc and postpartum blues in mothers conducted in Indonesia, especially in Makassar

Materials and Method

Location and Research Design

This research was conducted at St. Fatimah Hospital in Makassar. This type of research is analytic study with cross sectional design.

Population and sample

The population of this study was all mothers who were treated at St. Fatimah Hospital for the period of May-June 2017 that were selected by purposive sampling that had met the inclusion criteria, namely postpartum mothers who were treated at RS St. Fatimah March-May 2017 period, giving birth normally, multiparous mothers and willing to become respondents (filling in informed consent). Based on established criteria, 68 postpartum mothers were chosen.

Data Collection

Data collection was carried out by field officers and health workers. Depression scores were collected by field workers using the Edinburg Postnatal Depression Scale, which is a standardized measure for postnatal depression. In addition, data was also collected on smoking aspects through a questionnaire. The zinc data was determined through a blood plasma examination that was collected in the morning in the condition that the respondent did not fast by the health worker Zink Assay Kit (DIZN-250). It is a zinc inspection kit that has a good level of sensitivity and accuracy and does not require pretreatments.

Data Analysis

The research data were processed using SPSS version 22. To determine the differences in zinc levels in mothers with postpartum blues and normal used independent t test.

Results

Table 1. Characteristics of respondents

Characteristics	Number of Respondent	
	n	%
Age		
At risk	17	25,4
Not At Risk	50	74,6
Education Level		
Law	34	50,7
High	33	49,3
Occupation		
Be at work	4	6,0
Housewife	63	94,0
Family Income		
Below the regional minimum wage	31	46,3
According the regional minimum wage	36	53,7
Husband Support		
Yes	59	88,1
No	8	11,9
Family Support		
Yes	63	94,0
No	4	6,0
Smoking Status of Family		
Smoking	54	80,6
Not smoking	13	19,4
Postpartum Blues		
Yes	40	59,7
No	27	40,3
Zinc Level		
Very Low	28	41,8
Low	39	58,2
Total Amount	67	100

Based on table 1, it can be seen that the respondents in this study were mostly at the age of not at risk (20-36 years old) (74.6%), low-educated (50.7%), not working (housewife) (96%), having family income according to the Regional Minimum Wage (53.7%), received husband support (88.1%), received family support (94.0%), came from smoking families (80.6%), has postpartum blues (59.7%) and the zinc level is low (58.2%)

Table 2 Relationship between zinc levels and postpartum blues events

Level Zinc($\mu\text{g}/\text{dl}$)	Postpartum Blues	Normal	p*
Mean	11,65	9,91	0,263
Min	0,59	0,54	
Max	21,72	20,90	
SD	+5,6	+6,96	

*Independent t-test

Table 2 shows that zinc levels in mothers with postpartum blues are higher when compared to normal mothers. The difference is 1.74 $\mu\text{g} / \text{dl}$. But the difference was not significant ($p = 0.263$)

Table 3. Relationship between zinc levels and the incidence of postpartum blues

Zinc level ($\mu\text{g}/\text{dl}$)	Postpartum Blues		Normal		p*
	n	%	N	%	
Very Low	14	50%	14	50%	0,170
Low	26	66,7	13	33,3	

*Independent t-test

Table 3 shows that most mothers with postpartum blues have low zinc levels (66.7%) while those normal mother have very low zinc levels (50%). But the difference was not significant ($p = 0.170$)

Table 4. Relationship between zinc levels and the incidence of postpartum blues in mothers from smoking and not smoking family

Zinc Level ($\mu\text{g}/\text{dl}$)	Postpartum Blues		p*	Normal		p*
	Smoking	Not Smoking		Smoking	Not Smoking	
Mean	11,18	14	0,208	8,83	12,99	0,179
Min	0,59	10,55		0,54	2,24	
Max	21,72	20,28		20,9	17,78	
SD	5,8	3,1		7,04	6,15	

Based on table 4, it is seen that mothers with postpartum blues from smoking families have lower zinc levels (11.18 µg / dl) when compared to mothers with postpartum blues from non-smoking families (14 µg / dl). The difference is 2.82 µg / dl. But the difference was not significant (p = 0.208). Normal mother from smoking' families also had lower zinc levels (8.83 µg / dl) when compared to normal mother from non-smoking families (12.99 µg / dl). The difference is 4.16 µg / dl. But the difference was not significant (p = 0.179). The biggest difference in zinc levels between mothers of smoking and non-smoking families is found in normal mothers

Discussion

The results showed that zinc levels in all respondents were below normal, which is <66 µg / dl based on standards provided by the 2nd National Health and Nutrition Examination Survey of US⁸. The zinc level was measured in the morning when the respondent did not fast. The results of this study are the same as those found by Shah (2012), who looked at micronutrient levels in pregnant women. The study found that zinc levels in pregnant women in the Bontonompo and South Bontonompo districts were all deficient (<65mg / l)⁹. While research conducted by Daud NA (2004), found that 90.6% of pregnant women who became respondent in the study experienced zinc deficiency¹⁰ that the problem of zinc deficiency was still very high in Indonesia and specially in South Sulawesi.

As'ad revealed that the cause of the zinc deficiency problem was due to the diets of Indonesian people who were still plant-based and had little animal food. Though the main source of zinc is found in meat, fish and shellfish. Even though plant foods such as peanuts, seeds and legumes, cereals, tubers and vegetable fruits contain high levels of zinc, their bioavailability is low because there is fiber and phytate that binds zinc so it is difficult to be absorbed by the body¹¹

The results showed that zinc levels in mother with postpartum blues were higher (11.65 µg / dl) compared to zinc levels in normal mother (9.39 µg / dl). The difference is 2.26 µg / dl). However, no significant correlation was found between the incidence of postpartum blues and zinc levels in respondents (r = 0.226). The results of this study are the same as those found by Magnusson in

Sweden (2011), in a study conducted to assess the risk of postpartum depression with zinc levels at delivery, found that there were no differences in zinc levels in patients with postpartum blues and not (p = 0.428) on measurements 3 days postpartum. The study also found that zinc levels were positively correlated with EPDS scores precisely at 6 weeks post partum¹²

Likewise, Crayton's study, which assessed differences in zinc levels in 3 groups of women, namely women with a history of postpartum depression, women who have no history of postpartum depression and women with depression but do not have a history of postpartum depression. Apparently there were no significant differences in zinc levels in the 3 groups of women¹³

The results showed that zinc levels in respondents from smoking 'families were lower (10.02 µg / dl) compared to zinc levels in respondents who came from nonsmoking' families (13.61 µg / dl). The difference is 3.49 µg / dl. But no significant relationship was found between the smoking status of the respondent's family and the zinc level (r = 0.052).

In this study, the role of zinc as an antidepressant has not been seen. Because higher zinc levels are actually found in mothers with postpartum blues. This could be due to the postpartum blues that play a dominant role are psychosocial factors and other biological factors, such as hormonal changes in the mother. Another cause is that all mothers in this study have zinc deficiency, so the role of zinc as an anti-depressant is also not yet seen. Like studies conducted in Europe, which found no relationship between mood and zinc status¹⁴

Higher zinc levels in mothers with postpartum blues may be caused because these mothers consume more zinc source foods, such as shellfish, beef, chicken meat and eggs. And on the other hand they consume less Fe tablets. As is well known, that zinc and Fe compete with each other to be absorbed on enterocytes. In the condition of deficiency, which is more absorbed is a defective micronutrient in the body. If Fe is deficient, then Fe will be absorbed more. Conversely, if zinc is deficient, zinc will be absorbed more. But in normal circumstances, usually Fe will be absorbed more. One of the main nutritional problems experienced by pregnant women in Indonesia is iron deficiency anemia. This

shows that the mothers who were respondents in this study experienced iron deficiency so that more iron was absorbed so as to inhibit zinc absorption

In addition, most of the studies that have been conducted do look at the role of zinc in depressive events in general. The role of zinc in postpartum depression might have been discovered by Wojcik in his study. But as part of postpartum depression, in the postpartum blues the role of zinc is not seen

Studies conducted which found an association between the severity of depressive symptoms and postpartum maternal zinc levels differed in the design of this study⁷. Because Wojcik looked at longitudinally zinc levels with the severity of depressive symptoms, whereas our studies used a cross-sectional design. Wojcik did his studies in Poland, which is an industrial country with a low zinc deficiency problem. Whereas this study was conducted in areas with severe zinc deficiency problems. This is what could be causing differences in results

The majority of respondents came from smoking families (81.4%). This is in line with the results of Basic Health Research in 2013, which found that 85% of households in Indonesia were exposed to cigarette smoke. In fact, we all know that cigarette smoke originating from the tip of a burning cigarette (sidestream) is as dangerous as mainstream mainstream cigarette smoke so that the effect on passive smokers is almost the same as that felt by active smokers

Cigarettes contain toxins that increase free radicals in the body. If free radicals cannot be neutralized by the body's antioxidant defense system, it can cause oxidative stress. In large quantities, oxidative stress will cause cell death

A study conducted by Etti et al. In Binjai found that the levels of zinc breast milk in mothers of smokers 'families were much lower than those of non-smokers' families. And the difference was statistically significant ($p = 0.008$). In this study, there was also a tendency for lower zinc levels in maternal plasma from smokers' families, although the difference was not statistically significant ($p = 0.063$). But this has shown that cigarette smoke can indeed be dangerous not only for smokers themselves, but also for people who inhale the smoke. Mainly people who live with smokers

Conclusion

This study found no significant differences in zinc levels in mothers with postpartum blues or not. But an important finding is the low levels of zinc in postpartum mothers in Makassar City. This is important to get attention because zinc plays an important role in the mother and children health

Acknowledgement: The author thanks the minister of research, technology and high education for the scholarships provided. The author declares no conflict of interest.

Ethical Clearence: This study requested ethical permission from the Health Research Ethics Committee of the Hasanuddin University Medical School

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Potential Use of Personal Health Records in Managing Hypertension: A Systematic Review

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Abstract

Hypertension is a major problem in both developed and developing countries. In 2015, worldwide cases of hypertension reached 1.13 billion people, and in 2025, it is expected to increase to 1.5 billion people. Every year, 9.4 million people die from hypertension and complications, but hypertension could be prevented by risk control. This literature study aims to assess the potential use of personal health records to manage hypertension. The method used in this research was the systematic literature review following the PRISMA protocol. Scientific articles were obtained from five electronic databases, namely PubMed, JSTOR, EBSCOhost, ProQuest, and Google Scholar, with publication dates between 2009 and 2019. Initially, we obtained 103 articles, but after screening there were only four articles that met the requirements for this study. The articles, which come from the USA, Canada and France, show the potential use of PHRs to manage hypertension because of their ability to keep a record of complete health data. There was a decrease of 5.25 diastolic BP points from 25.7% of active users. Based on this data, the tool can assess user level of hypertension risk. A further benefit of the PHR as a mobile application tool is the potential to increase awareness of and encouragement to engage in healthy behaviors so the risk of hypertension can be managed. The PHR is a tool to monitor physical exercise, diet, weight and the extent to which hypertension has been controlled based on blood pressure readings, examination results and related laboratory results.

Keywords: Hypertension; personal health record; risk prevention; hypertension management

Introduction

Hypertension is a major medical problem in developed and developing countries. It is the most common risk factor for cardiovascular disease, which is the number one cause of death in the world¹. Hypertension is known as the silent killer because the symptoms are usually undetectable. People often do not know they have hypertension and only discover it when complications occur. A person is said to suffer from hypertension if systolic blood pressure is equal to or above 140 mmHg and diastolic pressure is equal to or above 90 mmHg².

Hypertension cases continue to increase, and every year approximately 9.4 million people in the world die from hypertension and its complications³. World Health Organization (WHO) data in 2015 showed that approximately 1.13 billion people worldwide suffer from hypertension, and it is estimated that this will increase to 1.5 billion people by 2025⁴. In Southeast Asia, there are as many as 1.5 million deaths per year due to hypertension, and one-third of the population suffers from hypertension requiring treatment, which can lead to increased health costs⁵.

Hypertension is a major challenge in Indonesia, where the prevalence increased from 25.8% in 2013 to 34.1% in 2018⁶. Based on this data, only one-third of hypertension cases were detected. Hypertension is often found in patients 15 years or older, and the finding is closely related to lifestyle. As many as 36.3% of people with hypertension are smokers, 93.5% consume a decreased amount of fruits and vegetables, 52.7%

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consume more than 2000 mg/day of salt, 15.4% suffer from obesity, and 26.1% are not physically active⁷.

In Indonesia, especially in big cities, there has been a shift in eating patterns, which has led to an increased use of fast food and preservatives, which are known to have a high salt and saturated fat content and a lower fiber content. By knowing the symptoms and risk factors of hypertension, patients can be expected to participate in prevention and management with a modified diet and lifestyle or medication so complications can be avoided⁸. Risk factors of hypertension that cannot be changed/controlled are age, gender, family history and genetic factors. Risk factors that can be personally controlled are smoking habits, salt consumption, saturated fat consumption, alcohol use, obesity, lack of physical activity, stress and estrogen use⁹.

Because of the large numbers of people affected, researchers are interested in building a PHR prototype design, which will be an instrument for personalized health care and help to prevent the risks of hypertension. The latest technological developments have been very supportive for developing application of PHR that reside on mobile device. Using PHRs could improve medication compliance and provide increased availability of patient information related to hypertension. Hypertension sufferers who use PHRs may then be able to control their diets, increase physical activity and participate in various other prevention efforts.¹⁰

This study aims, first, to assess the benefits of using a PHR to prevent hypertension risks and overcome the condition. The second aim of the study is to learn what requirements must be fulfilled by a PHR application so users can enjoy the benefits.

Method

The method used in this research was a systematic literature review, in which several search strategies were used to identify relevant studies. A systematic search among databases was performed to identify articles that met the inclusion requirements.

Eligibility Criteria

In order to be included, the articles had to meet six criteria: 1) Included in academic journals found in online databases PubMed, JSTOR, EBSCOhost, ProQuest, or

Google Scholar, 2) Published in English, 3) Appropriately published as journals, articles, original studies, theses, systematic dissertations or reviews, 4) Available without charge, 5) Published between 2009–2019, and 6) Topic was hypertension management using PHRs and was published in the field of health informatics.

Search Strategy

A total of 103 articles were identified in PubMed, JSTOR, EBSCOhost, ProQuest, and Google Scholar. A duplicate check using Mendeley identified that 100 articles were free of duplications. After the inclusion criteria were applied and any articles that could not be accessed because of a payment requirement were eliminated, four articles were chosen for further analysis.

In searching for articles about PHRs used for hypertension management, the population was “patients with hypertension.” To find related articles according to inclusion criteria, this study used several PICO keywords, namely “hypertension” AND “PHR” OR “Personal Health Record” AND “Prevention and Risk of Hypertension.” From this process, there are articles matched: 11 PubMed articles, 38 JSTOR articles, 32 EBSCOhost articles, 19 ProQuest articles and 3 Google Scholar articles.

Below are details of the search strategies carried out in five online databases.

Details of the search strategy carried out in PubMed: “hypertension” AND “PHR” OR “Personal Health Record” AND “Prevention and Risk of Hypertension,” published between 01/01/2009 and 04/13/2019.

Details of the search strategy carried out in JSTOR: “hypertension” AND “PHR” OR “Personal Health Record” AND “Prevention and Risk of Hypertension,” published between 2009 and 2019.

Details of the search strategy carried out in EBSCOhost: “hypertension” AND “PHR” OR “Personal Health Record” AND “Prevention and Risk of Hypertension,” published between 2009 and 2019, published in English and publication area of health informatics.

Details of the search strategy carried out in ProQuest: “hypertension” AND “PHR” OR “Personal Health

Record” AND “Prevention and Risk of Hypertension),” published between 2009 and 2019, published in English and publication area of information technology.

Details of the search strategy carried out in Google Scholar: “hypertension” AND “PHR” OR “Personal Health Record,” published between 2009 and 2019, research articles.

Results

This study revealed four articles published in the US, Canada and France that met the requirements for analysis. The research designs used in these articles included qualitative, descriptive analysis, randomized trials, random effectiveness trials, and interventions. In general, the purposes of these four articles were almost the same namely to improve self-care in hypertensive patients by encouraging medication compliance, observing changes in biological outcomes, empowering patients, monitoring the quality of care and tracking prescribed care schedules.

The articles reviewed demonstrate benefits to managing hypertension by using a PHR. One article showed that positive health outcomes result from using a PHR application. Current technological advances are useful for developing flexible platforms that contribute to improved patient self-care. The following are the detail information about the studies.

The first article was entitled ‘Using Electronic Personal Health Records to Empower Patients with Hypertension’, published in 2011 in the US using qualitative methods and randomized group trials. The aim of this study is to increase PHR by including patient suggestions and examining their impact on patients. The results of this study reveal that using PHR affects patient’s blood pressure, empowerment, satisfaction with care and use of health services, and available information indicates a decrease in diastolic blood pressure. This result is related to the frequency of using PHR, which is influenced by a younger age with greater computer skills and a more positive provider communication rating. The conclusion of this article is that access to web portals and PHR is very meaningful if providers and facilities can integrate PHR into individual clinical practice settings and services so that doctors and patients can collaborate to improve health information.

The second article, titled ‘Personal health records and hypertension control: randomized trials’, was published in 2012 in the US using the effectiveness of randomized trials. The purpose of this study was to examine the impact of PHR on patients with hypertension, measured by changes in biological outcomes, patient empowerment, and patient perceptions of the quality of care because PHR user levels are still low. The results of this study are the involvement of patients in controlling personal health, increasing patient activity for healthy living behaviors, and making it easy to obtain health information. With a decrease of 5.25 diastolic BP points from 25.7% of active PHR users, it was determined by observing the patient’s activity, medical utilization, and how the patient felt. The conclusion of this article is that patients are given access to the empowerment of PHR experience and clinical interventions designed to encourage the use of PHR for the treatment of hypertension.

The third article entitled ‘Changing the management of hypertension using mobile health technology for remote monitoring and self-care support’, published in 2013 in Canada using the intervention method. The aim of this study is to improve patient self-care and to encourage interventions that depend on the patient’s continued adherence to the prescribed monitoring and treatment schedule. The constraints of this study are that PHR voice messages for patients are limited, do not adhere to blood pressure measurement schedules at home, and remote monitoring of blood pressure has not been done. The results of this study are that eHealth helps by setting treatment goals, assessing response to patient therapy, monitoring deviations from health control, and motivating patients to adhere to treatment. This application undergoes rigorous and precise usability testing. Advances in mHealth technology can improve patient self-care. For successful interventions, the mHealth application depends on patient compliance with prescribed monitoring and treatment schedules. The conclusion of this article is that for hypertensive patients, self-care is very important in controlling blood pressure properly. It is important to make the right lifestyle choices and adhere to the prescribed treatments.

The fourth article is titled Patient Port Portal Electronic Health Record in CKD and Hypertension Management: Meaningful to Use? ‘Which was

published in 2015 in France using a descriptive analysis method. The aim of this study is to facilitate patient involvement in establishing PHR for various chronic conditions. The obstacle of this research is that PHR has limited educational material about health and there is no interactive feature that allows patients to enter monitoring and development information from time to time. The results of this study showed that of the participants studied, 39% accessed the portal, and 0.80% used it to schedule meetings or review laboratory test results. Drug information was reviewed by 77%, and 65% requested refills. Less than a third of participants use the portal to communicate with nephrologists regarding medical advice. The conclusion of this article is that various forms of technology have been used to increase outreach to patients with complex medical problems. The most successful interventions have been shown to improve patient communication with providers, patient satisfaction and clinical outcomes.

Discussions

Why is the Use of PHRs Especially Beneficial for Hypertensive Patients?

Hypertension is a health problem commonly found in Indonesia, where about one in four people are estimated to suffer from this disease. Efforts to prevent and overcome hypertension problems in the community still have many obstacles¹¹. With the advancement of information technology, PHRs can be an alternative solution for the community to manage this chronic disease. PHRs are mobile applications, so they are very user-friendly and flexible in that they can be used anywhere and anytime.

Patient data obtained through the mobile application can be received in real time by health workers, so hypertension management can be more effective. Mobile-based PHR applications will support the compliance of users in managing chronic diseases¹². Mobile applications can also greatly help hypertensive patients in increasing medication compliance¹³.

The main functions of a mobile application in chronic disease management include: 1) Secure message services, 2) User access to health education, 3) Examination of drug interactions, 4) Monitoring of patient health behaviors, 5) Electronic medical record

functions, and 6) Daily records of activities. Patients can use the data recorded in a PHR to communicate with doctors or nurses.¹⁴

In the PHR usage test, patients who registered were given a unique username and password and were trained in the function of the PHR, including access, entering data and finding clinical information.

What Requirements Must be met by the Personal Health Record Application so Users Can Benefit?

The four articles reviewed outlined the requirements that must exist in the PHR application so patients can easily track and send health information, and so it is easier for patients to get involved in accessing health records. The application must be associated with information that comes from outside the medical record and have storage so data is more concise and can be displayed quickly according to patient needs. This will facilitate patient health reporting and work automatically with data quality and information standards. In that way, data can be controlled and integrated with supporting software in PHR applications.¹⁵

The design of Android-based PHR applications for hypertension management is dependent on hardware, namely Android phones, laptops or PCs. These applications can be used by health workers in health services, on servers and internet networks, through modems and local area networks (LANs)¹⁶. Software can be designed using programming languages Java or Python and be connected to databases with access to general data, medical histories, physical examinations, laboratory data and other information¹⁷.

Conclusions

PHRs as mobile applications can be auxiliary tools for patients managing hypertension. Based on the articles reviewed, PHRs can encourage users to participate in carrying out healthy living behaviors. PHRs can be tools to monitor physical exercise, eating behaviors, weight control, and the extent to which hypertension has been controlled based on measures such as blood pressure and related laboratory results. This research should be continued to develop more PHR prototypes, and the use of PHRs should be tested to determine how they can be used to control hypertension.

Ethical Clearance: No ethical approval was required since this is literature study and there is no impact on humans.

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

Acknowledgment: This study is sponsored by Universitas Indonesia through 'Hibah PITTA B' 2019 or Indexed International Publication for Student's Final Project funding No.NKB-0595/UN2.R3.1/HKP.05.00/2019.

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The Effect of Using Social Media on Psychological Violence of Adolescents Dating in Developed Countries: A Systematic Review

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Abstract

Background: The violence to women in the world is still happening, about 38% and 19.5% as percentage in dating with opposite sex. The most violence is psychological/emotional violence with 77 percent. The use of social media for adolescents has negative effect as the way of psychological violence that effect their mental health.

Methods : The methodology of this study was systematic review that conducted by journals search through online databases of Proquest, Science Direct, and Sage Publications from 2009-2019. The keywords of searching were PICO-S (population-study intervention outcomes compare design) by using Query dating violence and internet abuse and social media and psychological abuse and adolescent. There are 6 journals that support research inclusion criteria.

Findings : Based on 6 journal articles analyzed about the use of social media and adolescents' dating violence include actions such as compulsion, over jealous, and aggressive on social media. The violence starts from sixth grader of primary school and improves in middle high school and senior high school.

Conclusion : The use of social media effects on dating violence then become problems on psychology health such as reproductive process in the future.

Keywords: Dating violence, internet abuse, social media, psychological abuse, adolescent.

Introduction

Youth are 10-19 years old people. The number of youth in Indonesia is 63.82 million people, which is a quarter of Indonesia's total population ⁽¹⁾. The number of man is more than women with ratio of 102.36, which means that each of 102 young men has also 100 young women. The percentage of urban youth is greater than in the countryside of 56.68 % versus 44.32%. Youth is valuable asset and human resource of future national development ⁽²⁾.

Adolescence is transition period of children to adulthood with characteristics on rapid growth of physical, psychological, and social. The change of boys raise pride, more athletic, confident and want to be treated as adult, opposite with girls that their physical changes makes them ashamed due to their larger physically and growth on breast. Physical changes of adolescents make them sexually mature so that there is sexual pressure from men who feel they are able to have relationships with other sex ⁽³⁾. Social development improves the quality of interpersonal relationships due to it enables them to have better understanding on desires, needs, feelings, and motivations. Therefore, the more complex thoughts, emotions, and identities in adolescence, the more complex their social relationships. One of the activities that they do today is dating that involves

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feelings and physical youth⁽⁴⁾.

Relationships between men and women during adolescence raise problems such as violence. The major motivation to do violence is their inability to control emotions then express feelings such as anger, frustration or sadness⁽⁵⁾. These behavior due to grow in watching violence so that violence is understood as a reasonable behavior. The existence of technological advances makes it easy to access information and communication with applications, but adolescents cannot control it then raise violence in communication.

Violence is one of responses to pressures. This response can cause harm to self, others and environment. Violence in dating is an act of violence to partner who is not legally married yet where there is an imbalance between the roles of women and men to control their power and discrimination that would hamper women's progress. There are several types of violence on women such as physical, emotional or psychological, economic and restrictions of physical activity⁽⁵⁾.

The violence on women is still happening, around 38% of women in the world had experienced violence and 19.5% occur in adolescents in dating with opposite sex⁽¹⁾. There are 10,847 violent cases in Indonesia and the most violent in dating with 2090 cases⁽⁵⁾. The violence in dating in developed countries reaches 84% of social media abuse such as psychological violence on girls that are mostly afraid of reporting their violence experiences. The type of violence are 77% verbal abuse/emotional, 32% physical abuse, 20% threats, 15% sexually, 13% domestic violence, 6% who observe/see violent behavior in their environment. The new phenomenon of cases of violence on women based on cyber or cyberspace. In 2017, there were 65 cases, improve in 2018 with 97 cases⁽⁶⁾. The majority of adolescents in developed countries use social media, 77% of them have telephone and 95% of adolescents of 12-17 years have social media on mobile phone⁽⁷⁾.

The violence cases in modern era has improved along with the development of technology that can be easily accessed by adolescents. The use of social media is different for each of adolescents depends on their social-culture, demographic and psychological aspects⁷. Social media is not just platform which individuals can express themselves directly, but also can raise negative

behavior or even the way such as violence⁽⁸⁾.

The social media interaction can be a problem for users, especially adolescents. The serious health problems can occur in adolescents, especially girls such as depression, anxiety, low self-esteem, free sex, smoking, consuming alcohol and drugs. These victims are able to do bad things for their own health such as smoking, consuming alcohol, depression, suicide and obesity⁸. Adolescents often use online technology for communication by giving each other information privately. When they get misuse information, it can lead them to do bad behaviors. The improvement of victims of psychological violence in dating can damage adolescent psychology with loneliness, low self-esteem and poor mental health⁽⁹⁾.

The huge number of dating violence is the impact of women who do not know the form of physical or psychological violence in a dating relationship. It makes them vulnerable as the victim of violence. Adolescence is an important, critical and independent period so that it is expected that it can prevent crime, but many of them do not yet know of the recommended self-rescue efforts in their country⁽¹⁰⁾.

The violence in relationship is part of public health problem that needs attention. It can be happened in patriarchal culture, racism, heterosexism and poverty. It also can be happened in all environments such as family, school, community, and social media. The violence includes abusive, aggressive and restrictions of activities in dating relationship. It is influenced by interpersonal experiences in parenting since children to adolescence. The adolescents who have parents of psychopathology and also social media exposure will improve influences and risk of violence in dating⁽¹¹⁾.

The target of SDGs number 5 is end violence against women in Sustainable Development Goals to achieve gender equality and empower women and girls to have health reproductive in the future. Meanwhile, the cases of this violence are still happening until today.

Methods

Journal search strategy by identifying relevant journals. The journals in this study were taken from an electronic database. The process of determining journals

that meet the research inclusion requirements by using PRISMA as a research instrument and journals that are not relevant to the inclusion criteria are eliminated.

Journal selection using an online database with query Dating violence AND cyber abuse AND social media AND psychological abuse AND adolescent through 3 database namely proquest, sage publications and science direct. Using the proquest database, 3626 journals were found, then screened based on free open access, in English and in 2009-2019 so that it was reduced to 78 journals, then duplicated checks were made so that it was reduced to 72 then selecting journals based on titles and abstracts with 3 selected journals. The second database using sage publications found 63 journals then screened reduced to 41 journals then journals selected according to abstracts and relevant titles so that 3 journals were selected. The third database using the science direct database found 121 journals then screened and duplicated checks so that it was reduced to 31 journals which were then selected according to the relevant titles and abstracts totaling 1 journal for analysis. Inclusion criteria that meet the requirements are a research journal in English, published in 2009-2019, adolescents aged 12-24 years who are dating and use social media. Exclusion criteria were adolescents who did not have relations with the opposite sex, then journal articles that were not in English and research using systematic review.

Results

The search that has been carried out can identify 6 journals from several developed countries in the world. The study was conducted in the USA, Australia, Ohio, Texas and California. There are 6 journals using quantitative methods, namely cohort and cross sectional. The results of the journal are that adolescents are very at risk of violent behavior, especially when going out with the opposite sex.

In quantitative research a statistical calculation is performed with a p value <0.05, which means that social media increases psychological disorders in adolescents due to dating violence, and perpetrators of violence increase with increasing technological progress. Adolescents with the age of 12 years or 6th grade elementary school have started to recognize dating behavior and have not been able to solve problems in dating violence so as to increase psychological disorders

in adolescents, the cohort study followed by adolescents with 6th grade education at elementary, junior and senior high schools shows an increase in vulnerable dating behavior psychological violence occurs through social media, resulting in adolescents experiencing depression and lack of confidence in their activities.

Discussion

Psychological violence is a verbal behavior such as insulting, saying rude and dirty which results in decreased self-confidence, increased fear, loss of ability to act and helpless. Psychological violence includes behavior aimed at harassing, intimidating and abusing in the form of threats or abuse of authority, monitoring, taking the rights of others, damaging objects owned by the victim, verbal aggression and humiliation. This action can result in other people or groups suffering physical, mental, spiritual, moral and social growth disorders⁽¹²⁾.

Psychological violence in courtship can take the form of acts of violence, threats, violence or coercion, insulting and isolating victims from friends and family and denying victims access to money, communication tools and other resources. When viewed from the impact caused by violence, there are two things that are more prominent, namely physical and psychological impacts. The important thing to examine is the psychological impact on women victims of violence, because the impact is more settled on future lives⁽¹³⁾.

Violence in courtship is still common in adolescent life. Factors in the location of residential areas affect adolescent behavior for example in developed countries and in urban areas the incidence of violence in courtship is higher than in developing countries. Violence in courtship continues to be a social problem that is approaching adolescents today with psychological, physical and sexual violence from current and ex-girlfriends through social media. Adolescents who start from 10-19 years are prone to experience violent behavior that began in 6th grade and will increase in senior high school age with a wider social environment and the use of social media that can facilitate youth to commit violence⁽¹⁴⁾.

The life environment of adolescents has a relationship with friends, groups, couples and families which is the context of the community where social

relationships are established in schools, workplaces, and the environment where individuals live. Identifying community characteristics can be associated with individuals who are victims and perpetrators of violence, negative communities pay less attention to adolescents in the environment. The cause of violence in the community is the weak sanctions that are owned by the community regarding dating violence. So it requires an environment that supports

Social media exposure is the intensity of a person's condition exposed or exposed by messages spread through a media. The persuasive messages that have been provided can trigger changes in behavior, attitudes, views and perceptions. Exposure to social media can be operated with the media used, frequency of use and duration of use. The use of social media in general is heavily influenced by environmental factors, but is further determined by the existence of negative motives towards the interlocutor⁽¹⁵⁾. In social media there is no limit to accessing information by not being able to control emotionally, making it easier for adolescents to commit violence against close friends/ partners.

Psychological violence in courtship adolescents in developed countries has increased along with technological progress. Teenagers use the most communication technology by using social media on mobile phones. The use of social media is used inappropriately to commit acts of violence on adolescents, especially in dating relationships, because adolescents who are dating often communicate that cause physical restrictions and excessive jealousy towards their partners, causing discomfort to depression. Restrictions on the use of social media need to be considered to reduce the incidence of psychological violence in dating of adolescent. adolescents to carry out positive activities to avoid dating behavior and violence⁽¹⁶⁾.

The role of parents regarding parenting given to children influences behavior in adolescence, with parenting parents who are passive not paying attention to the child's growth so that children experience problematic behavior, low self-esteem and depressed mood because they do not build emotional intelligence to adolescents⁽¹⁷⁾ Changes in behavior among adolescents in the modern era with advances in technology make it easy for adolescents to find friends to communicate

and exchange ideas that can change the behavior and thoughts of adolescents. The existence of external factors that exist in cyberspace makes it easy for adolescents to engage in negative behavior⁽¹⁸⁾.

Actions of violence in courtship that are often done by adolescents, namely limiting the space for adolescents, excessive jealousy, coercion and harassment which is a form of violation of social norms in adolescents, feminism perspective shows violence in courtship occurs in social contexts dominated by men as perpetrators of violence are influenced by the dominant norms of masculinity and femininity of gender in the social environment⁽¹⁹⁾. Adolescent girls experience pressure from men during dating, such as sending nude photos, coercion to have sexual relations, lowering the self-esteem of women spread on social media and threats that can make depression so that the psychological condition of adolescent girls is worse⁽²⁰⁾.

Acknowledgement: The author would like to thank Ms. Sabarinah Prasetyo for providing valuable guidance in the process of writing a journal using the systematic review method.

Conflic of Interest: The authors declare no conflicts of interest in this study

Source Founding : Independent (Self based)

Ethical Clearance : ethical clearance taken from supervisor committee in faculty of public health.

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Public Perception of Physical Distancing in Preventing the Spread of Coronavirus Disease (COVID-19) in the City of Banda Aceh in 2020

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Abstract

Introduction: Corona Virus Disease 2019 (COVID-19) is a pandemic disease occurred in 2020 which is followed by ongoing control efforts. Physical distancing is one of the government's policies to stop the spread of corona virus. In the city of Banda Aceh, there are two community gathering places that are usually used, first is the coffee shop and second is place of worship such as mosque and mushola. One factor difficult to control is the behavior of the people of Aceh who like to hang out for a long time in the coffee shop, sitting together while enjoying coffee. If the people do not pay attention to the government appeal, it is feared that COVID-19 will be widely spread.

Objective: This study aims to determine the knowledge and behavior of the public on physical distancing in preventing the spread of COVID-19 in the City of Banda Aceh in 2020.

Methodology: The method used here was descriptive survey. The population in this study were all people in the city of Banda Aceh. Data collection used Google Form. The samples were collected in 30 days as many as 196 respondents.

Results: The survey results found that 93.9% of respondents had good knowledge on physical distancing, there were 90.8% respondents who agreed that gathering in a coffee shop could transmit COVID-19 and 57.1% understood that lock down could prevent the spread of COVID-19. Regarding the respondents' behavior, it was shown that 7.1% still travelled out of town, 52% stayed at home and 89.8% left the house when they needed something. Regarding the respondents' habits, 78.6% always wore a mask when leaving the house, 87.8 % always washed their hands in the space provided, 64.3%, always used hand sanitizer when touching an object in a public place, 42.9% still performed either five daily prayers or Friday prayer in congregation in the mosque. Furthermore, there were 83.7% who used private transportation, 5.1% gathered in a coffee shop among >4 people with a duration of more than 1 hour.

Keywords: COVID-19, Physical Distancing, Corona virus

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Introduction

Corona Virus Disease 2019 (COVID-19) which is caused by the COVID-19 virus, was first detected in Wuhan, China, in December 2019. On January 30, 2020, the WHO Director General stated that the outbreak was then a public health emergency of international

concern.¹ The number of cases of corona virus infection that causes COVID-19 continues to increase in various parts of the world. The rate of increase, both for the number of cases of infection, death and recovery, varies in each region.² The number of deaths is more than 43 thousand people and it infects more than 860 thousand people. Of the number of death cases, more than 30 thousand of them occurred in Europe. Italy and Spain are the biggest contributor to deaths from the corona virus on the continent.

According to the World Health Organization (WHO) COVID-19 is a disease of global concern. With various control efforts made, incidents and deaths, due to COVID-19 still continue to increase. On 30 January 2020 WHO has designated the Public Health Emergency of International Concern (PHEIC). The increase in the number of COVID-19 cases take place quite quickly and there has been a spread outside the Wuhan region and other countries. As of February 16, 2020, 51,857 cases of confirmation were reported globally in 25 countries with 1,669 deaths (CFR 3.2%).³ In Indonesia the number of positive cases in May was 12,776 cases, 2,381 people recovered and 930 died, while the development of this disease in Aceh Province was 17 cases.⁴

The main symptoms are fever, cough, sore throat, and shortness of breath⁵. This means that the infection spreads easily with various respiratory conditions (such as pneumonia). There is a need for vigilance to reduce the growth rate of the epidemic, especially, the first approach involves social distance - that is avoiding excessive contact with others to stop the spread of infection within and outside the community⁶. Physical distancing behaviors include not permitting shake hands, keeping a distance of at least 1 meter when we have to interact with other people. These practices had been carried out in South Korea where research results evidenced the potential role of social distance in reducing the spread of COVID-19.⁷

In the city of Banda Aceh, there are two community gathering places that are usually used, first is the coffee shop and second is place of worship such as mosque and mushola. One factor difficult to control is the behavior of the people of Aceh who like to hang out for a long time in the coffee shop, sitting together while enjoying coffee. If the people do not pay attention to the government appeal,

it is feared that COVID-19 will be widely spread. This study aims to determine the knowledge and behavior of the public on physical distancing in preventing the spread of COVID-19 in the City of Banda Aceh in 2020.

Methodology

The study method used here was descriptive survey. Method of descriptive survey type in this study aims to study and describe public perception of physical distancing in preventing the spread of COVID-19 in the City of Banda Aceh in 2020.

The population in this study were all people in the city of Banda Aceh. Data were obtained by the respondent's approach then the size of the study sample was equal to the number of questionnaires that were filled out, returned, and feasible to be processed. The determination of population was also based on previous observations through the Google form that was distributed through the WhatsApp application from the groups owned by researchers and the respondents were asked to continue it to their friends and colleagues. There were 196 respondents who were collected in 30 days.

Data collection methods needed in this study were questionnaire and documentation study. The type of questionnaire used in this study was closed questionnaire or structured questionnaire. Closed Questionnaire is an alternative questionnaire that the answer choices have been provided. Documentation study is used to collect data about the procedures for making and using Google Form, it was carried out by giving questionnaires to respondents using Web-based interactive service at <https://tinyurl.com/survey-covid-umum> and other data that supported and complemented the study data in the form of written, image and electronic documents.

Data Analysis: Data analysis used here was descriptive statistical analysis to analyze data by describing or describing data that have been collected just the way they are without intending to make conclusions that apply to the public or generalization.

Study Results

Characteristics of Respondents:

Characteristics of Respondent based on the questionnaires that were filled out and returned, as

presented in the Table 1 as follows:

Table 1: Characteristics of Respondents

No	Characteristics of Respondents	Total	%	
1	Gender	Male	116	59.2
		Female	80	40.8
2	Age	<=20 years	18	9.2
		> 20 years	178	90.8
3	Educational Level	Senior High School/similar level	40	20.4
		D-III	36	18.4
		D-IV/Bachelor	86	43.9
		Master	33	16.8
		Doctoral	1	0.5
4	Employment	Student	58	29.6
		Employed	126	64.3
		Unemployed	12	6.1

Knowledge:

In general, respondents' knowledge about covid-19 transmission is presented in the following table:

Table 2. Respondents' Understanding on the Spread of COVID-19 in the City of Banda Aceh in 2020

No	Variable	Total	%	
1	Do you know the meaning of physical distancing?	Yes	184	93.9
		No	12	6.1
			196	100.0
2	In your opinion, is sitting in a coffee shop can transmit Corona Virus Disease?	Yes	178	90.8
		No	18	9.2
			196	100.0
3	In your opinion, should a lock down be done to prevent the spread of Covid-19?	Yes	112	57.1
		No	22	11.2
		Only for People Under Supervision	62	31.6
			196	100.0

Behavior in the Prevention

Behaviors in the prevention of the spread of COVID-19 are presented in table 2 below:

Table 3. Distribution of respondents' behavior in the spread of COVID-19 in the City of Banda Aceh in 2020

No	Variable		Jumlah	%
1	Did you travel out of town in the previous 14 days?	Yes	14	7.1
		No	182	92.9
			196	100.0
2	Are you staying at home now?	Yes	102	52.0
		Sometimes	82	41.8
		No	12	6.1
			196	100.0
3	Did you leave the house if there was only an urgent need?	Yes	176	89.8
		No	20	10.2
			196	100.0
4	Are you still gathering in a coffee shop?	Yes	44	22.4
		No	152	77.6
			196	100.0
5	If so, how many of your friends usually sit at your table?	Alone	30	15.3
		2 people	24	12.2
		>2 people	22	11.2
		>4 people	10	5.1
			110	56.1
6	If so, how long do you sit in a coffee shop?	< 30 minutes	38	19.4
		30 minutes - 1 hour	30	15.3
		> 1 hour	10	5.1
			78	39.8
7	Do you still go to the market to shop for daily necessities every day?	Yes	48	24.5
		Sometimes	120	61.2
		No	28	14.3
			196	100.0
8	Did you wear a mask whne you went out?	Yes	154	78.6
		Sometimes	32	16.3
		No	10	5.1
			196	100.0

Cont... Table 3. Distribution of respondents' behavior in the spread of COVID-19 in the City of Banda Aceh in 2020

9	Do you always wash your hands in the space provided?	Yes	172	87.8
		Sometimes	18	9.2
		No	6	3.1
			196	100.0
10	Do you always use a hand sanitizer when touching an object in a public place?	Yes	172	64.3
		Sometimes	30	30.6
		No	5	5.1
			196	100.0
11	Are you still congregating in the mosque either for the five daily prayers or the Friday prayer?	Yes	84	42.9
		No	112	57.1
			196	100.0
12	Do you use private transportation when you leave the house?	Yes	164	83.7
		No	32	16.3
			196	100.0

In Table 3, it was shown that there were 7.1% of respondents who still travelled out of town, and there were 52% who stayed at home even though there were 89.8% who left the house when they needed something.

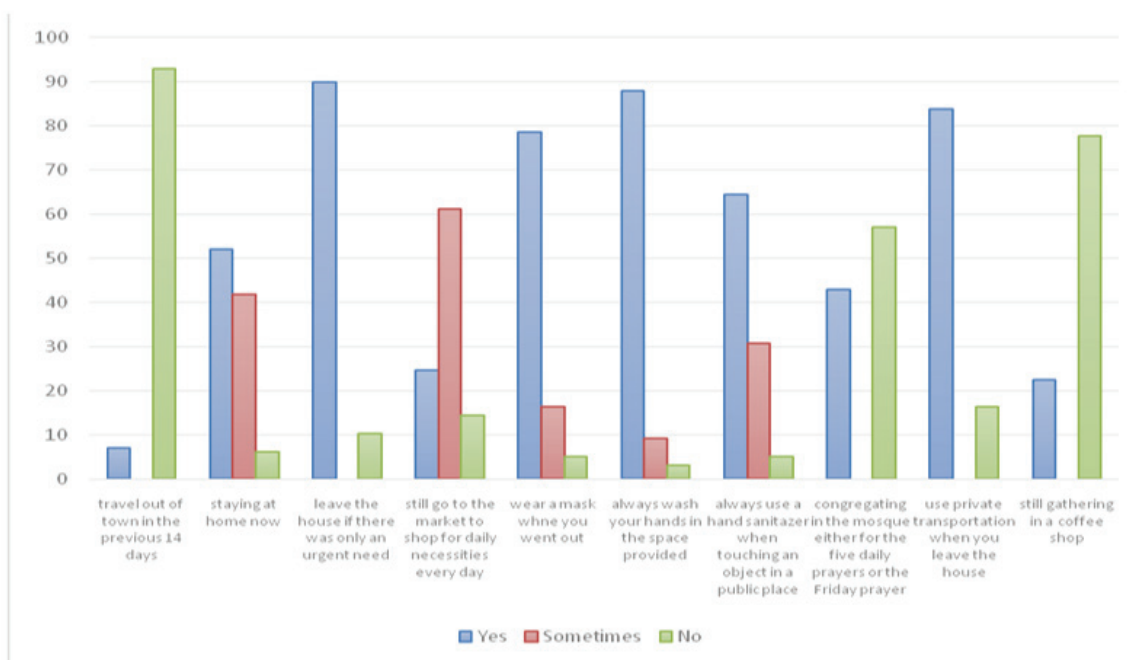


Figure 1. Graph on Behaviors regarding the Spread of Corona Virus Disease

The summary of the habits of respondents who answered that they were still used to gather in a coffee shop is presented in the following table:

Table 4. Distribution of habits related to gathering in a coffee shop based on the respondents in the City of Banda Aceh in 2020.

No	Variable		Total	%
1	Do you still gather in a coffee shop?	yes	44	22.4
		no	152	77.6
			196	100.0
2	If so, how many of your friends usually sit at your table?	alone	30	34,88
		2 people	24	27,90
		> 2	22	25,58
		>4	10	11,62
			86	100
3	If so, how long do you sit in a coffee shop?	< 30 minutes	38	44,18
		30 minutes - 1 hour	30	34,88
		> 1 hour	10	11,62
			78	39.8

Discussion

Those results were due to the developing information that could be accessed so that the public understood about the efforts to prevent COVID-19. Access to health information is a person's ability to know and act to obtain appropriate health services. Access to health information is recognized as a key determinant of health, such as mass media, electronic media, and others⁸. Increasing amount of information can enhance one's ability to obtain, process and understand health information for making the right decision in accessing required health services⁹. This is in line with the opinion which say that the role of access to health information includes knowledge about health¹⁰.

There are abundant information about Corona around Banda in the form of billboards that are installed as well as frequent monitoring of the assembled community. There is also an ease of information may be obtained from various media, especially news from the internet, even though sometimes the news is a hoax because social media is indeed a free space for everyone to express their attitudes, whatever they are. But that is not the only function that can cause problems.

Moreover, in the current situation related to corona virus diseases, everyone has a high sensitivity, even seeing or hearing someone sneeze and cough can make everyone suspicious¹¹. The emergence of social media is an additional challenge to ensure compliance. It is very important to wisely use social media as social media to provide opportunities to communicate the reasons for quarantine, certainty and practical advice and to prevent false rumors and panicity¹². Media outlets about the severity of COVID-19 can substantially influence the respond of Americans towards the pandemic.¹³

There were some views on the implementation of worship by eliminating fard prayer and Friday prayer and religious activities in the mosque. All activities should be done at home. However, there were other groups who responded to corona virus disease as an ordinary thing, so they said "we are afraid of corona, but do not afraid of God who creates corona". This sentence made people to carry out their usual activities as if there had never been a dangerous virus.¹⁴. Regarding respondents' behavior, it was shown that 7.1% still travelled out of town, 52% stayed at home and 89.8% left the house when they needed something. The WHO policy not to go out of town stipulates a corona virus outbreak.

Member States should consider options to prevent the entry of this disease to new areas or to reduce human-to-human transmission in areas where the virus that causes COVID-19 has widely spread.¹⁵

Always used hand sanitizer when touching an object in a public place. This is important because it can prevent transmission namely by maintaining hand hygiene as often as possible, especially after contact with respiratory secretions, before eating, and after using the toilet. Hand hygiene includes cleaning hands with soap and water or with alcohol-based antiseptics. Alcohol-based hand rubs are preferred if the hands are looked dirty; hands should be washed with soap and water when they are dirty. Furthermore, we should maintain social distance (at least 1 meter) from people with respiratory symptoms.^{15,16,19}

The habit of Acehnese people who like to sit in a crowded coffee shop sometimes make them difficult to accept to sit limited by distance and time duration. This is due to limiting social distance is an individual action that can affect public health epidemiologically and avoid exposure to areas with high transmission potential. However, it is a very unpleasant action that some people may reject.^{17,18} The exposure to potentially crowded places, using public transportation and being together with people suffering from a cold increased the risk of being infected with acute respiratory infections. This showed that social distance measures had an important effect on slowing the transmission of emerging respiratory infections.¹⁹ Other studies showed that performing work from home, social distance, no large gatherings or events, closing schools, restaurants, fitness centers, etc successfully reduced the number of COVID-19 cases²⁰

Conclusion

There is a need for strict rules and periodic monitoring, especially for stall owners, to take action to visitors who are disobedient towards physical distancing regulation.

Conflict of Interest: No

Funding Source: Self Funding

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Relationship between Dental Caries Prevalence and Elderly's Quality Of Life

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Abstract

Introduction: Tooth loss is experienced by the elderly as age increases the function of the oral cavity and the status of the oral cavity is closely related to physical, mental and social health. Physical and mental health has an impact on quality of life that will affect social interaction which ultimately impacts on the quality of life of the elderly. This study aimed to identify the relationship between dental caries and quality of life influenced by oral and dental health in the elderly. **Methods:** This study used cross sectional analytical method. Ninety-one respondents aged 45-90 years old were examined. The process of collecting data was done using the dental and oral health status of the WHO. To see the quality of life of elderly people, WHOQOL-BREF was used. Both types of data obtained were processed using statistical analysis to see the correlation. **Results:** Cross tabulation between the decay index and the quality of life of the physical domain of the respondents showed 1.31 higher risk to have poor physical health compared to those with low decay index (OR=1.31). In the domain of psychological health, respondents with high decay index had a 1.12 higher risk of having poor psychological health (OR=1.12). DMF index in the elderly with the social relations domain showed 1.50 higher risk for having a poor social relationship (OR=1.50). **Conclusion:** Elderly people with high DMFT index do not reduce quality of life, but quality of life will decrease if oral and dental health decreases.

Keywords: aged, dental care for aged, dental caries, quality of life.

Introduction

Dental and oral disease is a common disease suffered by people in the world. Both children and adults, including the elderly. When it reaches old age, there are many physiological and pathological changes in the body, which can have an impact on dental and oral health, both directly and indirectly. With all the changes that occur, resolving dental and oral health problems becomes a new challenge for health practitioners in the

world^{1,2}.

The quality of life itself is inseparable from the overall human condition consisting of general and oral health. The worsening of physiological conditions, polypharmacy and the high incidence of chronic diseases in the elderly can manifest in the oral cavity which can affect oral function, getting older, health conditions and oral cavity getting worse^{3,4}.

A study conducted in developed country showed chronic abnormalities in oral disorders that are often experienced by the elderly are tooth loss, dental caries and periodontal disease. Pain, disruption of the function of chewing and infection are symptoms of oral disease which can reduce the quality of life of the elderly. The negative impact of poor oral health on the quality of life of the elderly is an important public health problem. In

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the whole world, poor oral health in the elderly is mainly seen in the presence of dental caries⁵.

Caries and dental and oral health problems in the elderly are chronic, such as dental caries, tooth loss and periodontal disease⁶. Caries is disease that mainly occurs in the elderly. The opening of root surfaces accompanied by health status and the use of various drugs make the elderly at high risk for caries. Symptoms of oral disease include pain, infection and disruption of chewing function which can reduce the quality of life in the elderly⁷.

Elderly people with dental caries are more prominent because of physiological disorders, resulting in disruption of the function of mastication and jaw joints, and disruption of the enjoyment of life. The sharp increase in cases of tooth loss based on age groups illustrates that dental health efforts to maintain teeth as long as possible in the oral cavity have not been implemented well⁸. Likewise, the handling of oral dental diseases generally tends only to dental diseases, not comprehensive and holistic, which includes promotive, preventive, curative, and rehabilitative, aimed at all age groups⁹.

Subjects and Method

This study used a cross sectional method.

Respondents of this study were 91 elderlies who were randomly selected (simple random sampling) at the Surabaya Health Center. Examination of the quality of life score using the WHOQOL-BREFI questionnaire with question items using four domains, i.e. physical, psychological, social relations, and environment. Oral health examination was carried out using the WHO method. The number of dental caries was recorded and correlated with the data obtained from the questionnaire. The data obtained were processed and cross-tabulated using the SPSS application. The correlation analysis was cross-tabulated using Odds Ratio.

Findings

Out of a total of 91 elderly respondents, the majority were 60-74 years old (69.23%), male (32.97%) with final education below junior high school (57.14%), and some the number of respondents did not work (90.1%). The highest rate of caries was found in respondents aged 75-90 years (16.38) and most tooth loss also occurred at the age of 75-90 years (12.69).

The highest mean DMF was in respondents male sex (15.93). The lower the level of education, the higher the DMF index (16.265). The DMF index in the elderly who did not work (15.07) was higher than the average working elderly (Table I).

Table I. Average index of tooth decay, missing, and filling based on demographic characteristics

Characteristics	D	M	F	DMF
Age (years)				
45-59	5.67	5.00	0.25	10.92
60-74	5.25	9.83	0.16	15.08
75-90	3.25	12.69	0.44	16.38
Sex				
Male	4.40	11.77	0.10	15.93
Female	5.23	8.67	0.28	14.18
Education Level				
<middle school	5.585	10.81	0.085	16.265
>middle school	4.245	7.89	0.575	12.715
Working status				
Working	6.33	5.56	0	11.89
Unemployed	4.80	10.15	0.24	15.07

Table legends: D= Decayed, M= Missing, F= Fillings

Table II shows that older people who have systemic disease have a higher chance of having a lower quality of life related to the level of dental caries than the those who do not have systemic disease. Respondents with a high DMF index had 1.49 times higher risk of having a

bad mastication function compared to those with a low DMF index. There was no significant difference between the variable of self-confidence and the high DMF index compared to the low DMF index (Table III).

Table II. Correlation of quality of life with the DMF index

Variable	n	Quality of Life											
		Affected by systemic disease						Not affected by systemic disease					
		Speech function		Mastication function		Confidence		Speech function		Mastication function		Confidence	
		Poor	Good	Poor	Good	Poor	Good	Poor	Good	Poor	Good	Poor	Good
>13	45 (49.45%)	9 (49.45%)	8 (47.05%)	11 (64.70%)	6 (35.29%)	0	17 (100%)	13 (76.47%)	4 (23.52%)	13 (46.45%)	15 (53.57%)	3 (10.71%)	25 (89.29%)
≤13	46 (50.55%)	2 (20%)	8 (80%)	6 (60%)	4 (40%)	2 (20%)	8 (80%)	11 (50.56%)	8 (80%)	11 (50.56%)	23 (65.89%)	6 (16.67%)	20 (83.35%)
>3	43 (47.25%)	7 (50%)	7 (50%)	9 (56.25%)	7 (43.75%)	0	16 (100%)	9 (35.35%)	16 (100%)	9 (35.35%)	16 (59.26%)	3 (11.11%)	24 (88.89%)
≤3	48 (52.75%)	3 (27.7%)	3 (27.7%)	8 (72.73%)	3 (27.27%)	2 (18.18%)	9 (81.82%)	14 (57.84%)	9 (81.82%)	14 (37.84%)	22 (59.46%)	6 (16.22%)	31 (85.76%)
M>7	42 (46.15%)	8 (50%)	8 (50%)	8 (50%)	8 (50%)	2 (18.18%)	16 (100%)	11 (42.31%)	16 (100%)	11 (42.31%)	15 (57.69%)	2 (7.69%)	24 (92.31%)
M≤7	49 (53.85%)	3 (27.27%)	8 (72.73%)	3 (27.27%)	8 (72.73%)	2 (18.18%)	9 (81.82%)	13 (34.1%)	9 (81.82%)	13 (34.1%)	26 (68.42%)	7 (18.42%)	31 (83.58%)
F>0	12 (13.18%)	2 (50%)	2 (50%)	3 (75%)	1 (25%)	0	4 (100%)	2 (25%)	4 (100%)	2 (25%)	5 (62.50%)	0	8 (100%)
F=0	79 (86.82%)	9 (39.13%)	14 (60.8%)	14 (56%)	9 (44%)	2 (8.70%)	21 (91.30%)	23 (42.07%)	21 (91.30%)	24 (41.07%)	32 (57.14%)	9 (16.09%)	47 (83.93%)

Table III. Correlation between dental caries level and speech function, function of mastication, and selfconfidence.

Index	Odss Ratio		
	Speech	Mastication	Self-Confidence
DMF	2.26	1.49	0.32
D	1.70	0.94	0.37
M	0.55	1.02	0.22
F	0.77	1.13	0.77

Table legends: DMF Index, D= Decayed, M= Missing, F= Fillings.

Cross tabulation between the decay index and the quality of life of the physical domain of the respondents showed 1.31 higher risk to have poor physical health compared to those with low decay index (OR=1.31). In the domain of psychological health, respondents

with high decay index had a 1.12 higher risk of having poor psychological health (OR=1.12). In addition, the DMF index in the elderly with the social relations domain showed 1.50 higher risk for having a poor social relationship (OR=1.50), as shown in Table IV.

Table IV. Correlation between the level of dental caries and the quality of life of the elderly.

Index	Odss Ratio			
	Quality of Life			
	Domain 1 Physical Health	Domain 2 Psychological Health	Domain 3 Social Relation	Domain 4 Environment
DMF	0.73	0.55	1.50	2.62
D	1.31	1.12	1.32	7.62
M	0.55	0.35	1.39	1.61
F	0.77	0	0.85	0

Table legends: DMF Index, D= Decayed, M= Missing, F= Fillings.

Dental caries is strongly influenced by habits in maintaining dental and oral health. Dental caries may have an impact on quality of life, especially because of the experience of pain. The study found that the impact of pain on the teeth can cause changes in physical, psychological, social, and environmental conditions. Therefore, it is important to redirect dental and oral health services to the elderly¹⁰.

Dental caries can affect quality of life, especially because of the pain¹¹. The presence of systemic diseases will potentially worsen the quality of life of the elderly associated with the level of dental caries. The correlation between systemic disease and quality of life associated with dental caries causes the elderly to be more aware of the importance of their dental and oral health so that the quality of life of them remains good. One of the most prominent reasons is that parents consider oral dysfunction to be part of the natural process and the consequences of old age so that the elderly accept only the condition of the decline in quality of life without trying to get help¹².

Along with increasing age, there is also a decline in organ function and various physical changes. This

decrease occurs at various levels of cellular, organ, and system¹³. This results in an increase in the incidence of disease in both acute and chronic elderly. Symptoms of oral disease can include pain, infection and disruption of the function of mastication, which can reduce the quality of life for the elderly¹⁴. In the quality of life of the physical domains, respondents had 1.31 times higher risk of having poor physical health compared to populations with low decay index (OR=1.31). In the psychological health domain of high decay index, respondents had 1.12 times higher risk of poor psychological health (OR=1.12). In addition, the DMf index in the elderly with the social relations domain showed 1.50 higher risk for having a poor social relationship (OR=1.50).

This research was in line with research that states that the better oral health, the better the quality of life¹⁵. As a person ages, the health status of the teeth and mouth also decreases and the body's organs are also more susceptible to damage because they are used and functioned¹⁶. In addition, healthy behaviors, especially dental health, have no less role in the elderly's perspective on the influence of oral health on quality of life^{17,18}.

Quality of life is not only influenced by caries but also other factors, such as periodontal disease, sufficient socio-economic, education and knowledge, environment or culture around, and the level of self-awareness of each individual to maintain dental hygiene and mouth¹⁹.

Conclusion

The better the oral health, the better the quality of life. Quality of life will decrease if oral and dental health decreases. Therefore, empowerment is needed to overcome this condition.

Conflict of Interest : Nill

Acknowledgement: Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga

Source of Funding: Self funding

Ethical Clearance: Taken

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Socioeconomic Disparities, Pregnancy Factors and Inadequate Antenatal Care Utilization in Rural Cambodia

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Abstract

Background: Antenatal care (ANC) is widely known as the most efficient measures for reducing maternal mortality. This research aimed to describe ANC utilization pattern and identify the relationships of socioeconomic disparities, pregnancy factors and inadequate ANC among pregnant women in rural Cambodia.

Method: This cross-sectional study used the data from the Cambodia Demographic Health Survey (CDHS). The CDHS collected the data from 3,764 women who gave birth in the preceding five-year period using a structured questionnaire. The generalized linear mixed model (GLMM) was used to identify the association of socioeconomic, pregnancy factors and inadequate ANC utilization when controlling the effects of other co-variables presenting adjusted OR and 95% confidence interval.

Results: Among the total of 3,764 respondents. Almost one-third had inadequate ANC (31.59%;95%CI: 30.10-33.07%). Factors that were statistically associated with inadequate ANC were taking ANC in private sectors (adj OR. = 2.10, 95%CI: 1.47– 2.99), unwanted pregnancy (adj OR. =1.70, 95%CI: 1.44– 2.01), multiparity of three babies or higher (adj OR. = 1.66, 95%CI: 1.42– 1.94), illiteracy (adj OR. = 2.08, 95%CI: 1.41– 1.92), had spouse finished only primary education (adj OR. = 2.13, 95%CI: 1.45– 1.92) when controlling other factors including age, education, occupation, husband's age, occupation, financial status, accessing health facility.

Conclusion: Almost one-third of pregnant women in rural Cambodia had inadequate ANC. Both socioeconomic and pregnancy factors had influence on having inadequate ANC.

Keywords: Antenatal care, Cambodia, Pregnancy, Socioeconomic

Introduction

Maternal death is the death of women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes⁽¹⁾. More than 70% of all maternal death was due to direct obstetric causes, mostly excessive bleeding after

delivery, infection after childbirth...etc.^(2, 3). Maternal death is preventable⁽⁴⁾. Maternal and newborn death are preventable through good quality of ANC and delivery by skilled attendance⁽⁵⁻⁷⁾. The goal of ANC is not only preparing for birth or parenthood, but also preventing, detecting, alleviating or managing on three types of health problems. These health problems are complications of pregnancy, preexisting conditions that worsen the pregnancy outcome, and unhealthy lifestyle during pregnancy⁽⁸⁾. In addition, initiation of ANC as early as possible is essential for early detection, managing and prevention many causes of maternal death and help the mother to receive the full package of ANC services.

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From 2007 to 2014, only 64% of pregnant women attended ANC globally⁽⁹⁾. In developed countries, 98% of women received prenatal care and 94% gave birth by skilled health practitioners⁽¹⁰⁾ whereas there were only 40% in developing countries⁽²⁾. The adequate ANC, at least four visits during pregnancy, was only 50 to 75%^(5, 11-13). In addition, timely ANC visit (the first ANC visit is before 12 weeks) was only 20% to 50%^(11, 14-16). Rural women were more likely to have inadequate ANC when compare with those in urban setting^(12, 17).

The Cambodia Demographic Health Survey 2010 reported 89.6% of women had at two ANC visits and only 59.6% received four or more ANC visits⁽¹⁸⁾. However, only one-third of pregnant women in rural areas completed four ANC visits as recommended⁽¹⁹⁾. Cambodia has been continuously improving not only on socioeconomic but also health service system. Accessibility to importance health services such as ANC should be improved. However, the situation in rural settings still unknown. Therefore, this study was to describe the ANC utilization of pregnant women and roles of socioeconomic and pregnancy factor on inadequate ANC utilization in rural areas of Cambodia.

Methods

Study Design and Population

The cross-sectional study used the data of the Cambodian Demographic and Health Survey which was conducted in 2014. The survey used two-stage clustering sampling methods to select the participants which represent the total population of pregnant women. The inclusion criteria were women aged between 15 and 49 years old who were pregnant and gave birth between 2009 and 2014, had completed data on ANC, and lived in rural areas. There were 3,764 individuals selected. For the analysis.

Study Outcome

Dependence factor was categorical with coding as 1 for inadequate ANC which was referred to women attend less than 4-time ANC visit and receive first ANC visit at 12 weeks or more than 12 weeks. Even they attended more than 4-time ANC visit, but they received first ANC visit at more than 12 weeks were still considered as inadequate. They received first ANC visit at least than

12 weeks but attending less than 4-time ANC visit were still classified as inadequate. Outcome is coding as 0 for adequate ANC which is refer to women attended equally or more than 4 times ANC visit, and received first ANC visit within 12-week.

Data Analysis

To describe the independent and dependent variables, descriptive statistics which included frequency and percentage were used to describe categorical data whereas mean, standard deviation, median, and maximum minimum were for continuous data. A simple logistic regression was used to identify the association of each independent variable with inadequate ANC. The independent variable that had p-value <0.25 were processed to the multivariable analysis using the generalized linear mixed model (GLMM) to identify the association between socioeconomic and pregnancy factors with inadequate ANC when controlling the effect of other covariates. Regional which included 19 provinces were used as a random effect. The magnitude of association was presented as adjusted odds ratio (adj. OR), 95% confidence interval (CI) and p-value <0.05 was used as a statistically significant level. STATA was used for analysis.

Results

Among the total of 3,764 respondents, almost of them were married with an average age of 28.44 ± 6.17 years old. Their spouse's mean age was 31.42 ± 6.98 years old. Majority of the respondents finished only primary education (54.89%) and 27.92 % were Illiterate. About quarter were from the household with less deficiency wealth category (27.31%), 43.94% were self-employed and 57.33% had spouse working in agriculture sectors. Most of them had no health insurance (82.62%). Almost all get health service from public health facilities (95.88%) and get services from midwives. Two-third had problems on health expense (68.07%) while the permission, distance, someone accompany health facility was not a big problem. Concerning pregnancy history, the average age at delivery was 21.59 ± 3.91 years old. Most of them wanted to pregnant (86.37%). About two-third had less than two years birth interval from the first delivery and nearly half of them made decision on health service utilization by themselves (43.30%)

One-third of pregnant women had inadequate ANC (31.59%;95%CI: 30.10-33.07%). The inadequate of first ANC visit and ANC visit were 18.89% and 23.75%, respectively (Table1)

Table1: Prevalence of inadequate ANC in rural Cambodia (n=3764)

Factors	Number	Percentage	95%CI
First ANC Visit			
Adequate (first visit before 12 weeks)	3,053	81.11	79.82-82.34
Inadequate (first visit at 12 weeks or higher)	711	18.89	17.63-20.14
Number of ANC visit			
Adequate (≥ 4 times)	2,870	76.25	74.85-77.60
Inadequate (< 4 times)	894	23.75	22.39-25.11
Adequate ANC			
Adequate: first visit before 12 weeks plus ≥ 4 times	2,575	68.41	66.89-69.89
Inadequate: first visit at 12 weeks or higher plus < 4 times	1,189	31.59	30.10-33.07

Table2: Multivariable analysis of factors associated with inadequate ANC, by using GLMM; presenting odds ratios, adjusted odds ratios, 95%CI and P-value (n=3764)

Factors	Number	% inadequate ANC	Crude OR	Adj OR	95%CI	p-value
Health facility for ANC						<0.001
Public sectors	3,779	31.60	1	1		
Private sectors	160	46.88	1.91	2.10	1.47-2.99	
Wanted pregnancy						<0.001
Wanted	3,404	29.99	1	1		
Unwanted	537	46.37	2.01	1.70	1.44-2.01	
Parity (number baby)						<0.001
1-2	2,625	26.86	1	1		
≥ 3	1,316	42.93	2.04	1.66	1.42-1.94	
Literacy						<0.001
Literacy	2,858	27.40	1	1		
Illiteracy	1,111	44.01	2.08	1.64	1.41-1.92	
Spouse education						<0.001
\geq Secondary school	1,619	22.73	1	1		
No formal education or primary school	2,337	38.60	2.13	1.66	1.45-1.90	

The generalized linear mixed model (GLMM) indicated factors that were statistically associated with inadequate ANC were taking ANC in private sectors (adj OR. = 2.10, 95%CI: 1.47– 2.99), unwanted pregnancy (adj OR. = 1.70, 95%CI: 1.44– 2.01), multiparity of three babies or higher (adj OR. = 1.66, 95%CI: 1.42– 1.94), illiteracy (adj OR. = 2.08, 95%CI: 1.41– 1.92), had spouse finished only primary education (adj OR. = 2.13, 95%CI: 1.45–1.92) when controlling other factors including age, education, occupation, husband's age, occupation, financial status, accessing health facility (Table 2)

Discussion

Our study indicated 31.59% of pregnant women rural Cambodia had inadequate ANC which was lower than global recommendation. However, it was similar with findings of some previous studies reported that there were 50 to 70% of adequate ANC (4-visit of ANC during pregnancy) (5, 11-13). The possible reasons for the lower adequate ANC might be the cutoff point of adequate ANC were difference. In Cambodia, 4-visits or higher plus received the first ANC before 12 weeks was considered as adequate ANC whereas others such as Thailand used 5 visits (20). In addition, some countries did not consider the first ANC visit (21)

The results also indicated the association between inadequate ANC and taking ANC from private sectors. This finding was similar with a study in Ethiopia, reported accessing health service had influence on early timing ANC (11). The possible reasons might be the expense for services in public health care facilities were lower than in private. If they must get service in private sectors, it might because of inaccessibility in term of transportation and service hours. Public health care facilities usually available at front line level such as health center which provides basic health care for 100,000 people in the catchment area, especially rural areas with very minimum expense (22). In addition, for poor pregnancy, they received the Health Equity Fund (HEF), which is a pro-poor insurance aims to reduce financial barrier to health services. The voucher scheme which targets poor women to increase health service utilization covering delivery, family planning and safe abortion (23, 24).

Unwanted pregnancy was found associated with inadequate ANC. This finding was similar with

several studies, indicated that unplanned or unintended pregnancy had influence on late ANC accessibility (11, 16). It was well recognized that unwanted pregnancy or unplanned pregnancy could lead women to levels of careless in terms of their health care during pregnancy. In addition, the unexpected pregnancy may cause by failure of family planning practices that quite common among the low-educated couples.

Had delivered three babies or more were also found associated with inadequate ANC. This result was in line with the finding of a systematic review on the factors affected ANC in developing countries stating that women with high parity tends to use ANC less (25, 26). Furthermore, the study conducted in the capital city in Cambodia indicated multiparity was associated with ANC attendance (27).

The problem of illiteracy was also associated with inadequate ANC. Illiterate pregnancy women were more likely to have inadequate ANC than those literates. They might not access to information or did not understand the benefit of ANC since they could not read or write. In addition, the women with low-educated spouses were likely to have inadequate ANC. Other studies also indicated education as a predictor of ANC utilization. Spouses' education was significantly associated with under ANC utilization (19, 28-31). In the context of Cambodia, especially the rural areas, males are considered as the most powerful person in a family. In this circumstance, the spouse with higher education would understand about the essential of ANC and providing support or accompany their wife to seek these health care services.

Conclusion

Almost one-third of pregnant women in rural Cambodia had inadequate ANC. Both socioeconomic and pregnancy factors had influence on having inadequate ANC. The study indicated the needs for better coverage of ANC services in the rural areas of Cambodia. The low socioeconomic couples had more children should get more attention to get assistance to access adequate ANC. In addition, they should get proper family planning services since those with unwanted pregnancy were more likely to have inadequacy ANC. This situation might result in poor pregnancy outcomes, complication as well as life of both maternal and child.

Acknowledgement: Highest appreciation to the Mahachakri Sirindhons' Scholarship, Khon Kaen University, Thailand for scholarship, the USAID (DHS) for data set with authority.

Ethical Clearance : Taken from the Ethic Committee of Khon Kaen University. Based on the Declaration of Helsinki and Good Clinical Practice Guidelines (ICH GCP) No. HE622190.

Source of Funding -Self-Funding

Conflict of Interest – without

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Estimate Breeding Value, Variance and Gene Substitution Effect on Some Productive Traits on Holstein Cows Depending on DRB3 Gene Information

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Abstract

This study was conducted in Al-Salam station for Dairy cattle / private sector, (Al-Latifia district 25 km southern Baghdad), for the period from 1-11-2016 to 1-11-2017, on 50 Holstein cows to estimate breeding value, dominance deviation which made genetic variation for milk production and length of peak of lactation depending on DRB3 gene information and estimate average allele effect and average effect of allele substitution. The results of this study showed a significant effect ($P < 0.05$) of gene polymorphism on both traits, cows with AA genotype were better than cows with AB, BB respectively, also cows with AA genotype were better than cows with AB, BB genotype in breeding value for both traits, as that additive variance was higher than dominance deviation for both traits, and the average effect of allele substitution for allelic A was positive than allelic B and for both traits, that confirms the importance of used DRB3 gene data for breeding programs and the importance for allelic A selection when it found in a homozygotes or heterozygotes for both traits.

Keywords: Breeding value, Gene substitution effect, Productive traits, Holstein Cows

Introduction

After the great development in the detection of the composition of the genes in animals, depending on the information of the genome for detection of genetic variation in different genetic loci and overlap in their impact on the variability of productive traits after the calculation of the differences depends on the degree of similarity among individuals within the same family¹, breeding based on selection markers assisted and on genome information was focused on additive effect that plays an important role in influencing the physiology and evolution of farm animals², also the dominance effect had an added value on additive variance for studied trait variance, therefore, many studies have begun to study this effect because of the dominance variance of role in the total variation of productive traits^{3,4,5}, although the study of genetic maps has focused largely on the additive variance, many studies have stressed the importance of non-negligible contribution on QTL (Quantitative Traits Loci)⁶.

Total milk production and length of peak of lactation considered a quantitative traits that are influenced by heredity and environment effect, the heritability of milk production 0.16⁷, length of peak of lactation reflects the persistence of milk production for each cow during the one production season (Persistence)., this is an important economic characteristic of genetic improvement strategies⁸.

The bovine lymphocyte antigen (BoLA) system is known as the major histocompatibility complex of cattle^{9,10}. Major histocompatibility complex genes encode highly polymorphic cell surface glycoprotein molecules, which represent antigenic peptide to T-cells¹¹, thereby playing an essential role in the immune response to foreign agents. BoLA has been mapped to chromosome 23 and consists of class I, IIa, IIb and III regions¹², the DRB3 gene locus has received a wide attention because of its polymorphism and association with immunity and productivity in dairy cattle¹³, 130 BOLA-DRB3 alleles had been identified which contained 5 exons and 4 introns¹⁴.

And that polymorphism in alleles can produce more than 20 amino acid, that each allele has an advantage in expressing the type of complex compatibility of tissue and that these differences are in the location of binding peptide and antigen and thus specialized functionally to provide antigens for the production mainly from external proteins and parasites of T cells Helps T cells, as their cells play several important roles, including the effectiveness of phagocytes and lymphocytes. The phagocytic cells look out and swallow external viruses, bacteria and parts of most of the parasites attacking and thus play a large role in the Immune response anybody as long against diseases¹¹, so the aimed of this study was to estimated breeding value, total genetic variance and its content from additive variance and dominance variance and gene substitution effect for total milk production and length of peak lactation traits..

Materials & Methods

This study was conducted in Al-Salam station for Dairy cattle / private sector, (Al-Latifia district 25 km southern Baghdad), for the period from 1-11-2016 to

1-11-2017, on 50 Holstein cows to estimate breeding value, dominance deviation which made genetic variation for milk production and length of peak lactation depending on DRB3 gene information and estimate gene substitution effect of the gene, milk production was recorded twice daily in morning and evening and recording the total milk production and length of peak lactation for lactation season 2016-2017.

Blood collected by a medical syringe from the jugular vein in a 15 ml sterile polypropylene tubes containing 0.5 ml of EDTA (0.5 M) as an anticoagulant by the phenol chloroform extraction by the veterinarian at the station, The 284 bp fragment consisting (Paswan) of the 267 bp exon 2 region of the DRB3 gene and the flanking intron of 17 bp present in the genomic DNA of cattle was amplified by employing the corresponding primer pairs (forward and reverse)¹⁵, as a program in table (1), The details of the primer sequences are as follows :

F: ATCCTCTCTCTGCAGCACATTTCC

R: TCGCCGCTGCACAGTGAAACTCTC

Table 1. Program used to amplify DRB3 gene loci

Reaction stage	Temperature (°c)	Time	Cycles
initial denaturation	49	4 min.	30
denaturation	94	60 sec.	
annealing	60	45 sec.	
elongation	72	45 sec.	
Final elongation	72	5 min.	

(15)

After the polymerase reaction was completed, the polymorphism of DRB3 gene were identified in blood samples from the cows after proceed the cutting to the required piece of gene (284 bp) by restriction enzyme *HeaIII* from *Haemophilus aegyptius* bacteria the digestion with *HaeIII*.

Equations used to calculate values were according to¹⁶ as:

1- Average allele A effect $\alpha A = q [a+d (q-p)]$

2- Average allele B effect $\alpha B = q [a+d (q-p)]$

And average of substitution mean the different between the two values.

1-Breeding values

$\alpha 1, AB = \alpha 1 + \alpha 2$ $BB = 2 \alpha 2$ $AA = 2$

2- Dominance deviation

$AA = -2q^2d$, $AB = 2pqd$, $AA = -2p^2d$

3- Different data:

$$\alpha^2, VD=4p^2q^2d^2, VG=VA+VD \quad VA=2pq$$

Results and Discussion

After the polymerase reaction was completed, the polymorphism of DRB3 gene were identified in blood samples from the cows after proceed the cutting to the required piece of gene (284 bp) by restriction enzyme *HaeIII* from *Haemophilus aegyptius* bacteria. The digestion with *HaeIII* revealed four restriction sites, which resulted in three pieces:

- 1- AA allelic (167, 52 and 52) bp
- 2- AB allelic (219, 167, 52 and 52) bp
- 3- BB allelic (219 and 52) bp

The results showed that allele frequency for dominance allele (A) was 0.65 while the other allele (B) was 0.35, the number and percentage of distribution ratio of DRB3 gene polymorphism for AA, AB and BB which reached to 46.00, 42, 00 & 12, 00 % for respectively, table (2) showed that breeding value improved in AA genotype for total milk production and length of peak lactation on

other genotype AB, BB, whether, which reached 3.56 and 34.38 respectively, which means its superiority in terms of the variance of the phenotypic manifestations of the two studied traits, as the breeding value reflects the transferability and inheritance of phenotypic traits to the next generation, but the measurement based on genetic markers is 31% more efficient than traditional measurement methods¹⁶.

Dominance deviation value for total milk production trait was better in AB genotype when compared it with AA, BB genotype, which reached 14.68, in the other hand BB genotype was better than other genotypes AA and AB for length of peak lactation trait and reached 5.1, which reflects the initial interaction of the individuals carrying the heterozygotes, it promotes the idea of selection pure individuals of the dominant genotype (AA), which came at the lowest value of dominance deviations¹⁷, the value of the dominance deviations of the length of the peak lactation was also at the top for BB genotype (5.1) and the lowest value for the heterozygotes, which supports the selection of A allelic and for both studied traits.

Table2. Breeding values, dominance deviation for DRB3 genotypes and genetic variance and its content (Additive and dominance variance) for total milk production and length of peak lactation

genotype	Trait	Mean	Breeding value	Dominance deviation	VA	VD	VG
AA	Total milk production	1628.36	34.38	-7.9	22.34	215.719	238.059
AB		1601.83	-14.73	14.68			
BB		1510.77	-63.84	-27.27			
genotype	Trait	Mean	Breeding value	Dominance deviation	VA	VD	VG
AA	Length of peak lactation	50.27	3.56	-0.97	2.32	3.31	5.63
AB		49.91	-1.54	-1.8			
BB		42.41	-7.87	5.1			

The results from table (3) showed that dominance variance was higher than additive variance in total milk production, whereas, additive and dominance variance was convergent length of peak lactation trait, that additive effect will be inherited for the next generations¹⁸, for the dominance variance was an interaction of the alleles of the single gene site¹⁷, this result is largely consistent with the fact that total milk production one of the quantitative traits that are significantly affected by the environment as the heritability of this trait was 25%¹⁹, and this affected by a large number of genes²⁰, thus reducing the single effect of any of the studied genes, therefore, the study of more genes is useful in the development of breeding programs and mating for dairy cows²¹.

And noticed from this table to that allele A improved on allele B in Average effect of allele substitution value for both traits.

This result clearly indicates the possibility of using this gene in the selective programs to improve the studied traits for higher value of additive variance within total variance that AA genotype was the best because of its higher breeding value compared with other genotypes, because additive effect will inheritance to offspring (2), also average allele effect of allele within total effect for all effected gene on studied traits not to underestimate it (Average allele effect) between added or lost value as a result of the selection of one of allelic²², which supports the adoption of this gene within the selection breeding programs, this results may be attributed to the role of major histocompatibility complex gene to increase the immunity of the body against pathogens, including the bacterial causes of mastitis, which affects the mammary gland in cows and therefore reflected negatively on the production of milk during the milking season and thus will be affected by the duration of birth to reach the peak production and the peak production in these cows²³.

Table3. Breeding values, dominance deviation for DRB3 genotypes and genetic variance and its content (Additive and dominance variance) for total milk production and length of peak lactation

Allele	Trait	Average allele effect	Average effect of allele substitution
A	Total milk production	1.78	5.11
B		-3.32	-5.11
Allele	Trait	Average allele effect	Average effect of allele substitution
A	Length of peak lactation	17.19	49.116
B		-31.92	-49.116

Conclusions

It is evident from the above that it is important to adopt the data of this gene within the programs of improving the production of these two traits and their early prediction, as well as the importance of the selection of allele A and its true value if it is pure or hybrid for the both traits total milk production and length of peak lactation.

Conflict of Interest: None of the authors have any conflicts of interest to declare.

Source of Funding: The research was performed independently, there is no funding, influence over study design, analyses, manuscript preparation, or scientific publication.

Ethical Clearance: The project was approved by

the local ethical committee (College of Agriculture engineering science/ Baghdad University).

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Depression in Hyperemesis Gravidarum: Determinants and Extent in Al-Nasiriyah, Across Sectional Study

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Abstract

Objective of this study was to assess depression extent among hyperemesis gravidarum pregnant women in Thi-Qar. A cross sectional, hospital based, analytical study was carried out in two teaching hospitals Bent Al Huda and Al Habobi teaching hospitals in period from September 2015 to July 2016. In this study, all of pregnant participated are suffered from HG to obstetric outpatients. Based on Iraqi previous study 37.2% of depressive symptoms prevalence in pregnant women. Sample size had been calculated such prevalence rate with precision of 5%, confidence level of 95%, and added extra sample of 10%, to reach to 322. Beck depression inventory-II Arabic version BDI –II score of > 20 depression was considered used as a specialized questionnaire to achieve aim of study. Results showed 37.1% of HG pregnant women was depressed, which was significantly affected by previous history of hyperemesis $P = 0.03$, high socioeconomic status $P = 0.009$, increased gravidity $P = 0.03$ increased gestational age $P = 0.003$ and unwanted pregnancy $P = 0.03$. Reinforce mental health care of pregnant women through antenatal care services at primary health care level, with strengthening mental and social rehabilitation methods used for diagnosed women with depression.

Keywords: hyperemesis gravidarum, Pregnant, Depression

Introduction

Nausea and vomiting are earliest symptoms at pregnancy first trimester, start as soon as at 4th week of gestation with a peak at week 9–12 of pregnancy and fade at end of 1st trimester¹. It is varying in severity between pregnant women, being mild to moderate in approximately 80% of pregnant women and known as morning sickness, and severe in 0.5% - 2% of them and known as hyperemesis gravidarum HG, remain 18% have no symptoms of nausea and vomiting². It may stay continue for whole pregnancy period in 20% of pregnant women³. Nausea and vomiting in severe form intractable in early pregnancy is known as hyperemesis gravidarum⁴. Hyperemesis gravidarum is still vague and not completely understood⁵. It is believed that HG is a multi-factorial complex health event attributed to combination of different unrelated conditions such as genetic, environmental, hormonal and psychiatric

conditions⁶. Actually, different etiological theories of HG are suggested, but in fact only few of these theories are tested⁷. Such theories include role of infection with helicobacter pylori HP⁸, pregnancy specific factors such as fetal gender, multiple pregnancy, and molar pregnancies⁹, genetic factors, and ethnic factors, immunological changes during pregnancy¹⁰ and finally hormonal changes in early pregnancy¹¹. Different studies reported that HG is associated with different risk factors¹². In early pregnancy, changes in maternal circulatory levels of reproductive hormones especially human chorionic-gonado-tropin HCG are considered as a triggering factor for development of HG. This is because pattern of HCG secretion matches with onset, peak and relief from hyperemesis gravidarum, and association of high HCG levels with multiple gestation and molar pregnancy that are associated with higher risk of hyperemesis gravidarum¹³. Epidemiologically, rates of HG are different from each other among different countries, being higher in Asian countries than European¹⁴. HG is strongly associated with adverse outcomes on both fetal and maternal levels. As a longterm outcome, high rate of depression and

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serious neurological disorders were reported among HG suffered women¹⁵. Depression, Globally, depression represents a public health importance due to its higher rate during pregnancy. Its strong effects on development of postpartum depression and its impact on mother and fetus health¹⁶. Females have double risk of experiencing depression than male and at childbearing ages had higher tendency to develop depression than any other time in their lives¹⁷. Different theories explained pathophysiology of depression especially among pregnancy; including neurotransmitter theory and neuroendocrine system theory¹⁸. Mental illness among pregnant women in Arabic World is highly stigmatized health issue¹⁹. Nationally, scarce published information was related to depression prevalence among pregnant especially with hyperemesis gravidarum women. Aim of this study was to assess depression extent among hyperemesis gravidarum pregnant women in Thi-Qar / Iraq

Subjects & Methods

Study design & settings

A cross sectional, hospital based, analytical study was carried out in two teaching hospitals Bent Al Huda and Al Habobi teaching hospitals from first week of September /2015 to end of July 2016. All eligible pregnant women who were suffering from severe vomiting > 3 times/day without any other obvious underlying cause and were unable to maintain oral uptake with >3 Kg weight loss, and positive ketone urea, and who were attending obstetric outpatient of two hospitals were recruited for this study.

Exclusion criteria

Pregnant women with evidence of antenatal bleeding, with mild to moderate nausea and vomiting morning sickness, preexisting medical or psychiatric comorbid conditions, physical or psychological disabilities, patient refused to participate, and those using antibiotic, proton pump inhibitor, and H2 blocker at time of inclusion were excluded from the study.

Sample size calculation

An appropriate sample size and according to national demographic figures of Thi-Qar province at 2015 which was supplied by Ministry of Health Thi-Qar population

was nearly two million 1979561, 4% 79182 represents annual pregnancy target at 2015. Since incidence of HG is 2% worldwide $79182 \times 0.02 = 1583.6 \sim 1584$, 2,3,35 so it was estimated that 1584 of these pregnant women will suffer from hyperemesis gravidarum. estimated sample size is adjusted for estimated pregnant women who is expected to suffer from HGN=1584 by using following equation: $N_{adjusted} = \frac{N \times n}{N+n} \times 36 = N$ = population size 1584

n = sample size for infinite population

$n = adjusted = 1584 \times 359 / 1584 + 359 = 292.6 \sim 293$

researcher adds extra 10% 29 of sample to cover refusal or incomplete questionnaire so final sample size is 322.

Sampling Method

All HG suffered pregnant who attend obstetric outpatient clinic in nominated hospitals were included depending on inclusion and exclusion criteria.

Data collection data was collected by researcher by direct interview and filling two special questionnaires forms after signing the consent form. Objectives of study were explained and required ethics approvals were obtained. Data collected in groups of questionnaires. 1st is Arabic version of standard Beck depression inventory questionnaire- 37 , and 2nd is a special questionnaire. Beck Depression Inventory scale BDI screening instrument for detecting symptoms and severity of depression consists of 21 questions with a scoring ranging from 0-3 for each question and total score range from 0 to 63 . 2nd questionnaire includes different variables that are suspected to associated with depression among enrolled participants. These variables are titled under three main categories: demographic variables, socio-economic socio-economic scoring had been done according to Saadon et al study 38 variables, and obstetric variables.

Statistical Analysis

A computerized statistical software; Statistical Package for Social Sciences SPSS version 23 was used. Descriptive statistics are presented as mean \pm standard deviation. In all statistical analysis level of significance p value ≤ 0.05 .

Results

Mean BDI score of HG women was 20±12. Approximately 11.5%, 9.9%, 15.7%, 19.5% and 23% of participants suffered from extreme, severe, moderate depression, borderline clinical depression and mild mood disturbances respectively. Generally, depression prevalence among pregnant women with HG was 37.1%, as shown in figure 1.

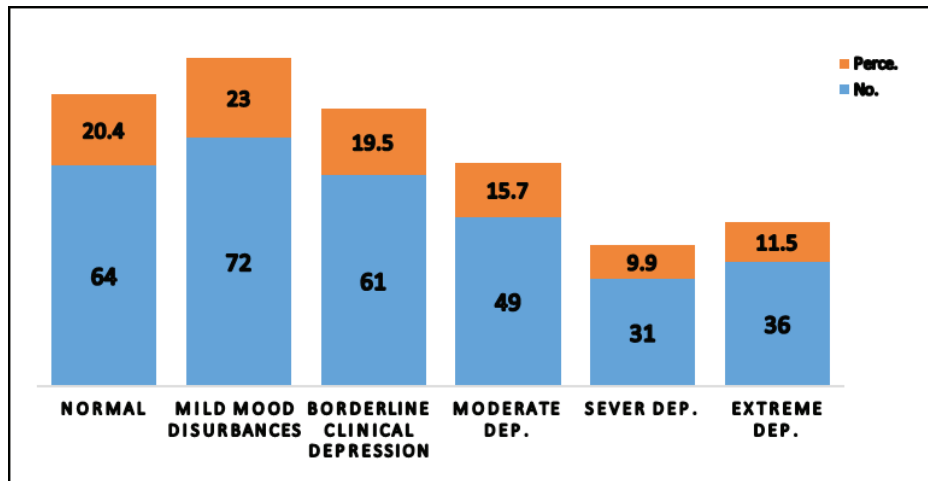


Fig 1: Extent of depression in hyperemesis pregnant

As shown in figure 2,3 there was no significant statistical association between depression and sociodemographic characteristics of studied women except for socio-economic character.

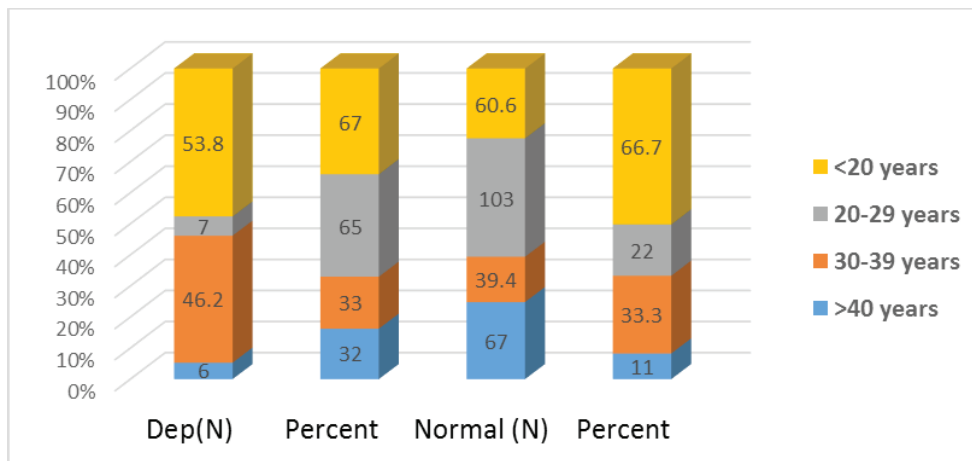


Fig 2: A. Distribution of age characteristics of HG women according to depression status P value=0.063. B. Distribution of age characteristics of HG women according to depression P value=0.228.

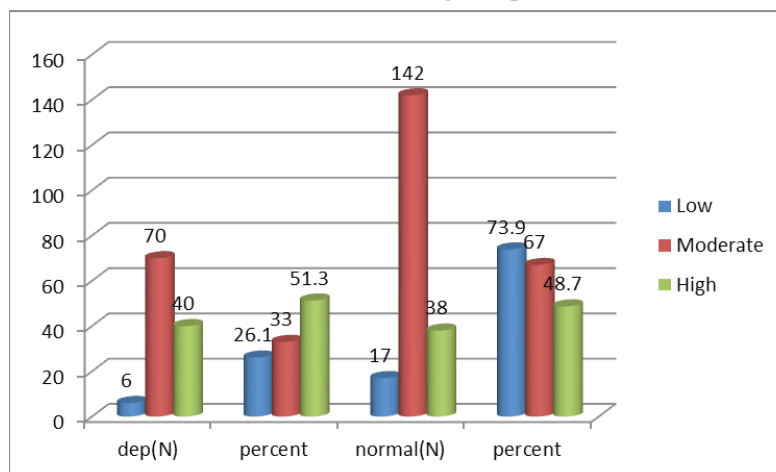


Fig 3: Distribution of socioeconomic characteristics of HG women.

As it is shown in figure 4, HG women with high socioeconomic status had higher depression prevalence $p=0.00$.

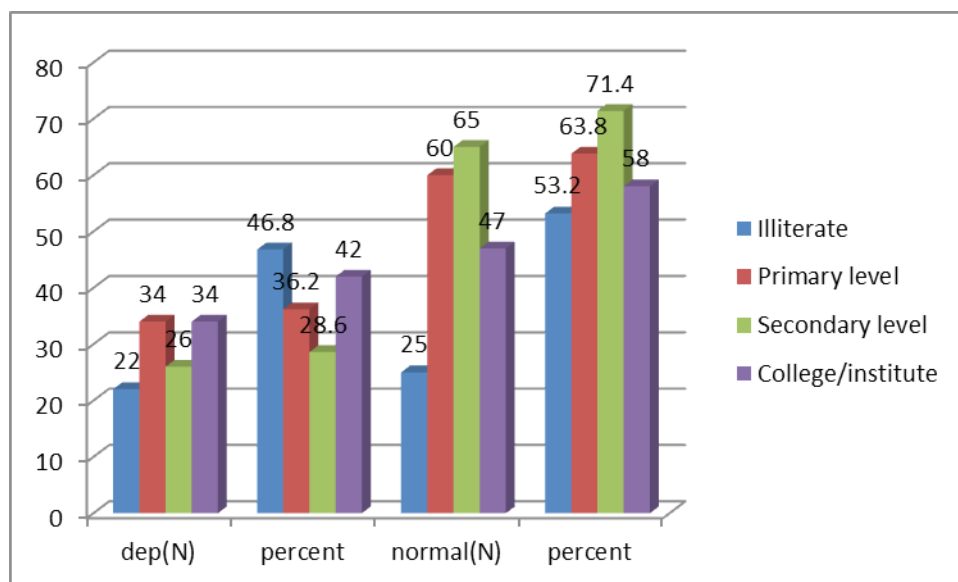


Fig 4: Distribution of occupations of HG according to depression P value=0.18 0.27.

Table 1 show significant association was observed between previous history of HG and depression prevalence $p=0.03$. No significant association was observed between depression and multiple pregnancy $p=0.8$. Women with HG who did not want this pregnancy had significantly higher depression $p=0.03$.

Table 1: A. Distribution of obstetric history of HG women according to depression status, B. Distribution of determinants means of HG according to depression Mean \pm SD

A. Distribution of obstetric history of HG women according to depression status						
Variable	Depression		No depression		χ^2	P
	No.	%	No.	%		
History of HG						
Yes	72	42.4	98	57.6	4.4	0.03
No	44	30.8	99	69.2		
Multiple pregnancy						
Yes	7	38.9	11	61.1	0.2	0.8
No	109	36.9	186	63.1		
Wanted pregnancy						
Yes	88	34.4	168	65.6	4.3	0.03
No	28	49.1	29	50.9		

Cont... Table 1: A. Distribution of obstetric history of HG women according to depression status, B. Distribution of determinants means of HG according to depression Mean \pm SD

B. Distribution of determinants means of HG according to depression Mean \pmSD				
Variable	Depression	No depression	t-test	P
Gravida	3.6 \pm 2.4	3.1 \pm 1.7	2.08	0.038
Parity	2.2 \pm 2.05	1.8 \pm 1.6	1.8	0.07
GA at time of review interviewweeks	9.6 \pm 2.2	9.4 \pm 3.2	0.6	0.5
GA at appearance of HG HGweeks	6.6 \pm 1.9	6.07 \pm 2.5	2.04	0.06
Miscarriage number	1 \pm 2	1 \pm 1	1.6	0.09

Table 2 show significant association was observed between increased gravida mean and depression $p=0.03$. No significant differences were observed between depressed and non-depressed women regarding age, parity, miscarriage number, and GA at time of interview and at appearance of HG $p>0.05$.

Performing logistic regression of these significantly associated variables revealed that only high Socioeconomic state SES previous history of hyperemesis gravidarum, and unwanted current pregnancy were significantly associated with depression among pregnant women, as shown in Table 2.

Table 2: Logistic regressing analysis

Significance	Variable	B	p-value	Expected B	95%CI for expected B	
					Lower	Upper
Significant	High SES	1.158	0.031	3.182	1.112	9.103
	History of HG	0.499	0.043	1.647	1.016	2.672
	Unwanted this pregnancy	0.680	0.023	1.973	1.099	3.544
Insignificant	Moderate SES	0.432	0.394	1.540	0.571	4.156
	Gestational age at interview >8 weeks	0.477	0.168	1.612	0.966	2.688

Discussion

Many authors indicate that HG is main reason for increased maternal hospitalization^(8, 20). HG is reported in 0.3% of all pregnancies⁽²⁰⁾. However, a few researches estimated the prevalence and explore relations of psychopathological factors which accompany pregnancy

⁽²¹⁾. In this study, depression prevalence among HG is 37.1%. This prevalence is lower than that reported by a previous study in Turkey which found that 53.9% of those with HG had moderate to severe depression. Depression prevalence which was reported by current study is higher than what estimated by Malaysian study⁽²²⁾ and an Omani study⁽²³⁾ 19% and 24.3% respectively.

These differences in depression prevalence among HG pregnant women might be attributed to discrepancies in lifestyle and cultural habits, socioeconomic status and general mental health in the community in addition to differences in study designs and depression scores among studies. Mean BDI score of HG in this study is 20 ± 12 . This finding is close to results of Turkey study⁽²⁴⁾ which stated that mean BDI score of pregnant with HG was 20.9. present study showed that 19.5% of pregnant women with HG had borderline depression, 15.7% of them had moderate depression and 21.4% of them had severe and extreme depression. These findings are relatively lower than those reported by a previous Iranian study⁽²⁵⁾ except for severe rank which revealed that 19% of HG pregnant women had mild depression, 46% of them had moderate depression and 7% of them had severe depression. This difference might be due to the use of BDI-SF Beck Depression Inventory-Short Form score by Iranian study. Etiology of HG is still unknown; however, many literatures demonstrate many mechanisms for HG like human chorionic gonadotropins effect, estrogen and progesterone effect, pregnancy thyrotoxicosis, H-pylori effect and other hormonal effects⁽²⁶⁾. Although this psychosomatic theory is considered a controversial topic, and it is dealt with by authors as the main cause of HG in early pregnancy which needs intensive mental health care⁽²⁷⁾. Many literatures from multiple countries document direct relationship between psychopathology of pregnant women and HG. A Previous study in USA 19 stated that even anxiety may be associated with onset of HG, depression, stress and behavior limitations which are more likely effects of HG symptoms. It is known that depression is a common mental disorder in pregnancy with prevalence range from 4% to 25% as it was found by many studies⁽²⁸⁾ which also that pregnant women in early pregnancy have depression prevalence of 15.5%, late pregnancy as 11.1% and in post-partum as 8.7%. High socioeconomic level of early pregnant women under investigation with HG which was associated significantly with depression. This finding is inconsistent with many studies like the study in USA and study in Tanzania⁽²⁹⁾ which revealed that low socioeconomic level of pregnant women in early pregnancy were an independent risk factor for depression. This inconsistency might be attributed to two explanations first was reported by previous Turkish study⁽²²⁾ which found a significant association between

HG in early pregnancy and high socioeconomic status of pregnant women and clarified that those women with high socioeconomic status might be more sensitive and might complain more than low socioeconomic status women. second explanation was stated by Japanese study which reported that employed pregnant women had lower rate of depression in early pregnancy and showed significant of social support in lowering depressive scores during pregnancy. In general, in our community and our study most of women are unemployed especially those living in moderate to high socioeconomic status families.

Conclusion

one-third of pregnant with HG had depression which was high on provincial level SES, history of HG and unwanted pregnancy was the main determinants. For that reason, it is recommended to: Implement mental health care programs targeting pregnant women through antenatal care services provided at primary health care level. awareness of medical Personal about depression among pregnant women should be raised. family Planning activities to mitigate unwanted Pregnancy must be reinforced

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

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Effects of Treadmill Gait Training According to Different Inclination on Pulmonary Function in Patients with Chronic Stroke

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Abstract

Objective: The purpose of the study was performed for effects of treadmill gait training according to different inclination influenced on the pulmonary function with hemiplegic patients caused by cerebrovascular accident.

Method: The subjects of the study were 44 patients with chronic stroke and randomly divided into three group which were two experimental groups (5° treadmill gait training (n=15) and 10° treadmill gait training (n=15)) and control group (treadmill flat gait training (n=14)). Three groups received different inclination (5°, 10°, flat) treadmill gait training for 30 minutes a time while 5 times per week for 6 week in addition to conventional physical therapy. We performed pulmonary function test.

Results: The result of this study showed that treadmill gait training controlled inclination 5°, 10°, flat plane were positive influence on stroke patients' pulmonary function. Especially, inclination 5°, 10° gait training group showed Significant improved than flat gait training group.

Conclusion: Gait training controlled inclination is an effective intervention in order to improve hemiplegia due to stroke patients' pulmonary function. It is considered to be treadmill gait training controlled appropriate inclination when in addition to treatment time.

Key word: Stroke, Pulmonary function, Inclination treadmill gait

Introduction

Stroke is caused by cerebrovascular bleeding or when a vessel supplying blood to the brain is clogged. Patterns of disability due to stroke vary according to the damaged areas of the brain and degrees of damage and usually include hemiplegia of the limbs, sensory impairment, cognitive disorder, and perceptual disturbance^(1, 2). Damage to motor control by a stroke can induce muscular weakness, spasticity, and abnormal motor patterns between the agonistic and the antagonistic muscles, restricting functional activities, such as walking, stair climbing, and self-care activities in daily life⁽³⁾. Stroke

patients easily feel muscle fatigue due to decreased physical activity. They also show a reduction in motor function due to decreased muscular endurance that can affect metabolism⁽⁴⁾. In terms of respiratory function of these patients, reduction in cooperative motor control of the respiratory muscles affects the normal postural control of the trunk, weakening the movement of the thorax and the strength of the respiratory muscles⁽⁵⁾.

Stroke patients can increase muscular strength, improve balance, and re-perceive the motor control in their walking patterns by training on a treadmill⁽⁶⁾. Low-intensity walking on a treadmill for at least 20 minutes a day positively affected the cardiovascular circulation of stroke patients when compared to an existing training program⁽⁷⁻⁹⁾. Slope walking has been found to improve the flexion angles of the hip, knee, and ankle joints

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between the initial stance phase and the swing phase in the paralyzed lower limb of stroke patients⁽¹⁰⁾, while the energy consumption during walking for the same time and at the same speed was maximized when the slope was 12 degrees⁽¹¹⁾. Treadmill walking with increased slope and speed was able to induce strong activity in the trunk muscles⁽¹²⁾, showing correlations close to statistical significance among trunk control, the respiratory muscles, and the pulmonary function of these patients⁽¹³⁾. However, not many studies have directly examined the effects of varied walking slopes on pulmonary functions. We investigated how walking on a treadmill at varied slopes affected the pulmonary function of stroke patients.

Methods

Participants

The subjects of this study were 45 patients who were diagnosed as having had a stroke and were hospitalized (1) for at least six months, (2) without orthopedic or cardiopulmonary diseases, and (3) who were able to walk independently at least 30 meters indoors. They were randomly divided into three groups of treadmill training with 0°, 5°, and 10° of slopes (n = 15 for each group). Each group received a 30-minute physical therapy session based on the concept of neurophysiological treatment, as well as a 30-minute walking training session on the treadmill three times a week for six weeks. The same investigators measured the subjects' pulmonary function before and after training by using measurement devices. All subjects understood the content of this study based on the ethical principles of the Declaration of Helsinki and submitted written consents as volunteers. The study was approved by the Daegu University Institutional Review Board for Human Studies Committee and conducted in accordance with the Declaration of Helsinki (IRB 1040621-201807-HR-001-02).

Intervention

We increased the walking speed on the treadmills in such a gradual way that it did not curtail independence or stability in walking. After maintaining the speed that was measured during a pre-test of ten-meter walking as much as possible until being stable, each subject walked on the 0°, 5°, or 10° slope according to their assigned group. To reduce associated reactions that

could be induced by walking, the subjects walked on the treadmills with both hands gripping the front handles; those who could not use one hand had that hand fixed on the handle with a strap. The slope walking was assisted by a skilled physical therapist.

Measurement

We used a Desk Top Spirometer Pony FX (COSMED Inc., Italy) to measure the Forced Vital Capacity (FVC), the Forced Expired Volume in one second (FEV₁), and the Peak Expiratory Flow (PEF) to estimate the pre- and post-training pulmonary functions. The measurement was obtained with the subjects in the seated position with the knee and hip joints bent at 90°. Before the measurements were taken, the subjects were asked to breathe in and out three times normally. The participants were then asked to breathe in and out as quickly as possible by expanding their lungs completely each time with maximum effort. Once the above process was complete, the subjects were asked to push the "STOP" button to indicate that the measurement was complete.

Statistical Analysis

The IBM SPSS Statistics 20.0 software was used for the statistical processing of the results obtained from this study to analyze the effect of treadmill gait training on the pulmonary function in patients with chronic stroke.

For the physical characteristics of each group and the measurement data of each variable, the mean and the standard deviation were calculated, and the normality test using the residuals of the result data was confirmed by the Shapiro–Wilk test. One-way ANOVA was used to analyze the general characteristics of the experimental and control groups.

A paired t-test was performed to determine the changes in respiratory function and respiratory pressure before and after intervention in each group. One-way ANOVA was used to compare the differences in respiratory function and respiratory pressure before and after intervention in each group, and LSD was used for post-hoc test. The significance level (α) of all statistics was set to 0.05.

Results

One patient in the group of 0° treadmill training was discharged from the hospital, 44 subjects participated in the study to the end. For the group of 0° treadmill training (n = 14), the mean age was 62.07 ± 5.95 years, the mean height was 160.78 ± 9.07 cm, the mean body weight was 61.35 ± 10.73 kg, and the mean walking speed for ten meters was 0.55 ± 0.15 m/s. For the group of 5° treadmill training (n = 15), the mean age was 56.46 ± 9.77 years, the mean height was 165.53 ± 6.89 cm, the mean weight was 67.00 ± 8.88 kg, and the mean walking speed for ten meters was 0.53 ± 0.14 m/s. For the group of 10° treadmill training (n = 15), the mean age was 57.53 ± 5.54 years, the mean height was 163.53 ± 9.56 cm, the mean weight was 59.13 ± 10.25 kg, and the mean walking speed for ten meters was 0.49 ± 0.18 m/s. There were no significant differences in the general characteristics of the subjects between the groups ($p > .05$).

All three groups showed a significant increase in the

comparison test of FVC between pre- and post-training ($p < .05$). The variation test of FVC between pre- and post-training revealed a significant difference ($p < .05$). The post-test of the LSD (Least Square Difference) showed significant differences between the 0° treadmill group and the 5° treadmill group and between the 0° treadmill group and the 10° treadmill group ($p < .05$). In the comparison test of the FEV₁ of each group between pre- and post-training, the 10° treadmill group showed a significant difference ($p < .05$), while the 0° and 5° groups did not ($p > .05$). The post-test of the LSD based on exercise patterns of the three groups revealed significant differences between the 0° and the 5° groups and between the 0° and the 10° groups ($p < .05$). In the comparison test of the PEF of each group between pre- and post-training, the 5° and the 10° treadmill groups showed significant differences ($p < .05$), while the 0° group did not ($p > .05$). The post-test of the LSD based on exercise patterns of the three groups revealed significant differences between the 0° and the 5° groups and between the 0° and the 10° groups ($p < .05$).

Table 1. The comparison of mean for Pulmonary Function between pre and post value for the three groups (Unit : L)

		Pre-value	Post-value	t	p
		Mean±SD	Mean±SD		
FVC	0° training	1.90±0.49	2.14±0.50	4.03	0.00**
	5° training	2.33±0.62	2.84±0.78	2.84	0.01*
	10° training	2.41±0.82	2.77±0.67	3.62	0.00**
	t	2.46	4.78		
	p	0.09	0.01*		
FEV ₁	0° training	1.58±0.52	1.65±0.40	0.87	0.39
	5° training	2.03±0.64	2.10±0.62	0.82	0.42
	10° training	2.01±0.74	2.17±0.62	2.51	0.02*
	t	2.20	3.54		
	p	0.12	0.03*		
PEF	0° training	3.11±1.55	3.44±1.56	1.31	0.21
	5° training	4.02±1.63	4.88±1.84	2.75	0.01*
	10° training	3.70±1.48	4.98±1.59	4.96	0.00**
	t	1.25	3.78		
	p	0.29	0.03*		

M±SD : Mean ± Standard Deviation *p<.05 **p<.01

FVC : Forced Vital Capacity

FEV₁ : the Forced Expired Volume in one second

PEF : the Peak Expiratory Flow

Table 2. LSD test of FVC, FEV₁, PEF on each group

(Unit : L)

	Intervention	Intervention	MD	SE	p
FVC	0° group	5° training	-0.70	0.24	0.00**
		10° training	-0.63	0.24	0.01*
	5° training	0° group	0.70	0.24	0.00**
		10° training	0.07	0.24	0.77
FEV ₁	0° group	5° training	-0.44	0.21	0.03*
		10° training	-0.52	0.21	0.01*
	5° training	0° group	0.44	0.21	0.03*
		10° training	-0.07	0.20	0.72
PEF	0° group	5° training	-1.43	0.62	0.02*
		10° training	-1.53	0.62	0.01*
	5° training	0° group	1.43	0.6	0.02*
		10° training	-0.09	0.61	0.87

M±SE: Mean ± standard error *p<.05 **p<.01

FVC : Forced Vital Capacity

FEV₁ : the Forced Expired Volume in one second

PEF : the Peak Expiratory Flow

Discussion

When neurological impairment after stroke decreases the motor control essential to maintain muscular cooperation related to respiratory circulation, it can reduce the strength of the respiratory muscles and movement of the thorax, affecting normal respiratory function⁽⁵⁾. In this study, we investigated the effects of treadmill slopes on the pulmonary function of patients with chronic stroke by performing a six-week experiment.

In the FVC test for estimating pulmonary function, all three groups (0°, 5°, and 10° treadmill slope) showed significant differences between the pre- and the post-

experiment ($p < .05$). It has been reported that stroke patients who are able to walk independently show significantly higher FVC when compared to those who are not⁽¹⁴⁾. The subjects in this study were able to walk independently, showing higher FVC after the treadmill walking training than before the training. The post-test between the three groups revealed significant differences between the 0° and the 5° treadmill groups and between the 0° and the 10° groups ($p < .05$), indicating that walking on the 5° and 10°-sloped treadmills was more effective for improving FVC than walking on the 0° treadmill. As seen in one study, the activities of the trunk muscles, the rectus abdominis and the erector spinae, increased when the treadmill slope was larger⁽¹²⁾. Similarly, in this study, the increased FVC recorded when the treadmills were sloped could be caused by improved activity of the trunk muscles involved in respiration.

FEV₁ showed a significant increase in the 10°

treadmill group ($p < .05$), while not in the 0° or the 5° groups ($p > .05$). In the post-test between the three groups, significant differences between the 0° and the 5° groups and between the 0° and the 10° groups were seen ($p < .05$). FEV₁ was comparatively higher in the steepest (10°) treadmill group, in which the rectus abdominis muscle was most active. Although FEV₁ showed no significant differences in the 0° and the 5° groups before and after the training, it increased numerically. These results may be proportional to the increase in the treadmill slopes, indicating that treadmill walking as a type of aerobic gait exercise has positive effects on the FEV₁ of stroke patients.

When PEF of each group was measured, the 5° and the 10° treadmill groups showed significant differences ($p < .05$) while the 0° group did not ($p > .05$). In the post-test between the three groups, there were significant differences between the 0° and the 5° groups and between the 0° group and the 10° group ($p < .05$), indicating that PEF increased because the reduced expiration of the stroke patients was improved by the slope walking. Jandt et al.⁽¹³⁾ investigated correlations among the respiratory muscles, pulmonary function, and trunk control of stroke patients, reporting that a close-to-significance-level correlation was found between trunk control and the maximal inspiratory pressure and that sufficient correlations were observed among trunk control, the maximal expiratory pressure, and PEF. The results were consistent with those of this study; the 10° treadmill group, with the more active rectus abdominis and erector spinae muscles, showed the largest differences in PEF between the pre- and the post-training, followed by the 5° and then 0° groups. Slopes can also change energy consumption; many studies reported that energy consumption was highest when the treadmill slope was 12° for the same time and at the same speed⁽¹¹⁾. The results of this study, as well, indicated that the energy consumption of the 5° and the 10° groups was higher than that of the 0° group and that consumption contributed to an increase in the pulmonary function of the stroke patients.

There are a few limitations in this study. The results of the study are insufficient for generalization because of the small number of patients and the relatively short experiment period (six weeks). A continuous assessment could not be performed. Given that compensatory

movements can be induced for flexion of the lower limb joints as the slope increases, further training should be performed to promote correct posture and exercise methods.

In conclusion, walking training on a 0° , 5° , and 10° -sloped treadmill could positively influence the pulmonary function of patients with hemiplegia caused by stroke. Because the groups of 5° and 10° showed more significant improvements when compared to the 0° group, walking training on a sloped treadmill can be an effective type of intervention in enhancing the pulmonary function of chronic stroke patients.

Conflict of Interest: The authors declare no conflict of interest.

Acknowledgment: This research was supported by a Daegu University Research Grant in 2017.

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Published, Printed and Owned : Dr. R.K. Sharma

Printed : Printpack Electrostat G-2, Eros Apartment, 56, Nehru Place, New Delhi-110019

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