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Relation between Blood Lead Levels and Childhood Anemia

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Abstract

Background: Lead pollution is a major problem in developing countries. Childhood lead exposure is one of the most significant environmental health threats that affects children. In children, it is defined as a blood lead level equal to or greater than 10 µg/dl. Iron deficiency is a cause of hypochromic microcytic anemia, and also increases the absorption of elements like lead. Anemia in children leads to increased morbidity and mortality. This study was done to determine the relation of blood lead levels greater than 10 µg/dl with the anemia compared to levels less than 10 µg/dl.

Material and Methods: The conduct prospective observational study was conducted on 100 children. For each children haemoglobin, MCV, RDW and blood lead level were tested. 50 children with proven anemia and equal number of children without anemia were enrolled in the study and was analysed and their blood lead levels were tested.

Results: Out of 100 children, 63 were male and 37 were female. The overall children mean age was 73.65 + 52.94 months, male mean age was 73.30 + 51.52 months & female mean age was 74.24 + 55.99 months. The Prevalence of Iron Deficiency Anemia by MCV is 64.2% and Prevalence of Iron Deficiency Anemia by RDW is 58.8%.

Conclusion: Prevalence of Iron Deficiency anemia by MCV and RDW was 64.2% and 58.8%. However there was a significant difference between the anemic and Non anemic group regarding MCV and RDW. According to the study, there is minimal lead exposure and no lead toxicity in this area.

Keywords: *Lead, Iron deficiency Anemia, Hemoglobin, mean corpuscular volume, Red cell distribution width.*

Introduction

Anemia is a common phenomenon worldwide with a higher prevalence in developing countries. More than one fourth of the world's population suffers from anemia while iron deficiency anemia (IDA) accounts for half of such cases. It is mostly seen in preschool-aged children and women [1].

Lead pollution is a major problem in developing countries. Diet, air, drinking water and ingestion of paint chips are considered the primary sources of lead exposure in humans; with increased severity and frequency in developing countries through contaminated soil, water and air pollution. Lead poisoning leads to adverse interaction in cellular biochemical reactions, causing many organ malfunction [2].

Childhood lead exposure is one of the most significant environmental health threats that affect children. Blood lead level equal to or greater than 10

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µg/dl [3], are being associated with adverse behavioral and developmental outcomes. Recently no level less than 10µg /dl is considered safe [4].

Human exposure to lead occurs primarily through diet, air, drinking water and ingestion of paint chips where absorption is increased mainly in persons suffering from iron and calcium deficiency [5].

Environmental lead exposure occurs from automobile exhaust in areas of the world where leaded gasoline is still being used. At home exposure among children may occur either because of ingestion of old leaded chips or because of pigments and glazes used in pottery [6].

Anemia leads to increased morbidity and mortality in children [7]. Adverse health effects of anemia in children include impaired psychomotor development and renal tubular function, poor cognitive performance and mental retardation [8,9].

This study was therefore done to investigate the association of blood lead level $\geq$ 10µg /dl and the higher risk of anemia of varying severity among children. The study was conducted to study the relation between blood lead leavel and childhood anemia.

Material and Methods

Study Population:

This study was carried out on a total of 100 children from the pediatric ward in Krishna Institute of Medical Sciences, Karad. They were selected by a systematic random sample. Exclusion criteria of cases were children having anemia due to blood disorder. Children were classified into two groups, anemic group (50 children) withHb levels < 11 g/dl and non anemic group (50 children) with Hb levels > 11 g/dl, aged 6 months to 14 years. Mothers of children were informed about the aim of the study and their consent was obtained. Data related to age, gender, residence, source of drinking water, degree of father and mother's education and their occupation, According to the WHO definition of anemia based on hemoglobin level less than 11 g/dl, the studied population was divided into anemic and non anemic groups [10]. The anemic group was further classified into categories of mild (Hb level 10-10.9 g/dl), moderate (Hb level 8-9.9 g/dl) and severe (Hb level < 8 g/dl) anemia. Also, according to serum blood level, the studied population was classified into two groups, <10 µg/dl and $\geq$10 µg/dl.

Laboratory Investigations:

A venous blood sample was taken from each child and divided into three tubes. The first tube (containing EDTA) used for estimation of hematological parameters using Celtic auto-analyser, these parameters included the red blood cell count (RBC), hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), and red cell distribution width (RDW). The second tube (containing heparin) for estimation of lead by the atomic absorption spectrophotometer [11]. The third tube, Hitachi 911 auto-analyser was used for serum iron estimation using Roche reagent kits.

Statistical Analysis

Statistical analysis was done by SPSS statistical package Version 19 .Chi-square test was performed to compare individual characteristics and the t-test was performed to compare the haematological parameters between the two groups. P-value was considered statistically significant if <0.05. Pearson correlation test was used to determine the significant correlations between variables.

Results

In total 100 children were studied, 50 were anemic and 50 were non anemic. The children mean age was 73.65 + 52.94 months (range: 6 months - 14 years);

in total 63 (63%) children were male including 31 (49.2%) in the anemic group and 32 (50.8%) in the non anemic group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.836) [Table 1].

The frequency distribution of individual characteristics was studied among the anemic and non anemic group (table 1). There is no statistical significant difference was found for all individual characteristics but age is statistically significant among anemic and non anemic group. Also high prevalence of Educated Mothers (90.0%), Educated Fathers (96.0%) and those consuming Tap water (92.0%) among the anaemic and non anaemic group.

Table No.1: Frequency Distribution of Individual characteristics among the Anemic and Non Anemic group.

Variable / Group	Anemic (n = 50)	Non Anemic (n = 50)	P Value
Age			
Pre School (< 6 Years)	38 (76.0%)	16 (32.0%)	< 0.001 (Significant)
School (≥ 6 years)	12 (24.0%)	34 (68.0%)	
Sex			
Male	31 (62.0%)	32 (64.0%)	0.836 (Not Significant)
Female	19 (38.0%)	18 (36.0%)	
Mother Occupation			
Agricultural Work	6 (12.0%)	6 (12.0%)	0.679 (Not Significant)
Other Work	7 (14.0%)	9 (18.0%)	
Home Maker	36 (72.0%)	34 (68.0%)	
Expired	0 (0.0%)	1 (2.0%)	
Student	1 (2.0%)	0 (0.0%)	
Father Occupation			
Agricultural Work	8 (16.0%)	3 (6.0%)	0.178 (Not Significant)
Expired	0 (0.0%)	1 (2.0%)	
Other Work	42 (84.0%)	46 (92.0%)	
Mother Education			
Educated	45 (90.0%)	46 (92.0%)	0.727 (Not Significant)
Illiterate	5 (10.0%)	4 (8.0%)	
Father Education			
Educated	48 (96.0%)	49 (98.0%)	0.558 (Not Significant)
Illiterate	2 (4.0%)	1 (2.0%)	
Source of Drinking Water			
Tap Water	46 (92.0%)	49 (98.0%)	0.359 (Not Significant)
Hand Pump	4 (8.0%)	1 (2.0%)	

In the table no. 2 shows that the 53 were Iron deficiency Anemic and 47 were Non Iron Deficiency Anemic with respect to the Mean Corpuscular Volume. In total 63 children were male including 32 (50.8%) in the Iron Deficiency anemic group and 31 (49.2%) in the non Iron Deficiency anemic group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.564) [Table 2].

The frequency distribution of individual characteristics was studied among the Iron Deficiency Anemic and Non Iron Deficiency Anemic group with respect to the Mean Corpuscular Volume (table 2). There is no statistical significant difference in all individual characteristics but Hemoglobin is statistically significant among Iron Deficiency Anemic and Non Iron Deficiency Anemic group with respect to the Mean Corpuscular Volume. Also high prevalence of Educated Mothers (88.7%), Educated Fathers (98.1%) and those consuming Tap water (94.3%) were found among the anemia and group. The Prevalence of Iron Deficiency Anemia by Haemoglobin is 64.2% and also statistically significant difference between Anemic and Non Anemic group with Iron Deficiency Anemia.

Table No. 2: Frequency Distribution of Individual characteristics among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to Mean Corpuscular Volume.

Variable / Group	Iron Deficiency Anemia (n = 53)	Non Iron Deficiency Anemia (n = 47)	P Value
Age			
Pre School (< 6 Years)	32 (60.4%)	22 (46.8%)	0.174 (Not Significant)
School (≥ 6 years)	21 (39.6%)	25 (53.2%)	
Sex			
Male	32 (60.4%)	31 (66.0%)	0.564 (Not Significant)
Female	21 (39.6%)	16 (34.0%)	
Mother Occupation			
Agricultural Work	5 (9.4%)	7 (14.9%)	0.645 (Not Significant)
Other Work	8 (15.1%)	8 (17.0%)	
Home Maker	38 (71.7%)	32 (68.1%)	
Expired	1 (1.9%)	0 (0.0%)	
Student	1 (1.9%)	0 (0.0%)	
Father Occupation			
Agricultural Work	8 (15.1%)	3 (6.4%)	0.227 (Not Significant)
Expired	0 (0.0%)	1 (2.1%)	
Other Work	45 (84.9%)	43 (91.5%)	
Mother Education			
Educated	47 (88.7%)	44 (93.6%)	0.609 (Not Significant)
Illiterate	6 (11.3%)	3 (6.4%)	
Father Education			
Educated	52 (98.1%)	45 (95.7%)	0.916 (Not Significant)
Illiterate	1 (1.9%)	2 (4.3%)	
Source of Drinking Water			
Tap Water	50 (94.3%)	45 (95.7%)	0.748 (Not Significant)
Hand Pump	3 (5.7%)	2 (4.3%)	
Haemoglobin			
Anaemic	34 (64.2%)	16 (34.0%)	0.003 (Significant)
Non Anaemic	19 (35.8%)	31 (66.0%)	

In the table no. 3 shows that the 68 had Iron deficiency Anemia and 32 had Non Iron Deficiency Anemia with respect to the Red Cell Distribution Width. In total 63 children were male including 43 (68.3%) in the Iron Deficiency Anemia group and 20 (31.7%) in the Non Iron Deficiency Anemia group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.943) [Table 3].

The frequency distribution of individual characteristics was studied among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to the Red Cell Distribution Width (table 3). There is no statistical significant difference found for all individual characteristics but Age and Hemoglobin is statistically significant among Iron Deficiency Anemic and Non Iron Deficiency Anemia group with respect to the Red Cell Distribution Width. Also high prevalence of Educated Mothers (89.7%), Educated Fathers (95.6%) and those consuming Tap water (94.1%) was found in the anemia group. The Prevalence of Iron Deficiency Anemia by Haemoglobin is 58.8% and also statistically significant difference between Iron deficiency Anemic and Non Iron deficiency Anemic group.

Table No. 3: Frequency Distribution of Individual characteristics among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to Red Cell Distribution Width.

Variable / Group	Iron Deficiency Anemia (n = 68)	Non Iron Deficiency Anemia (n = 32)	P Value
Age			
Pre School (< 6 Years)	43 (63.2%)	11 (34.4%)	0.007
School (≥ 6 years)	25 (36.8%)	21 (65.6%)	(Significant)
Sex			
Male	43 (63.2%)	20 (62.5%)	0.943
Female	25 (36.8%)	12 (37.5%)	(Not Significant)
Mother Occupation			
Agricultural Work	10 (14.7%)	2 (6.3%)	
Other Work	11 (16.2%)	5 (15.6%)	0.612
Home Maker	45 (66.2%)	25 (78.1%)	(Not Significant)
Expired	1 (1.5%)	0 (0.0%)	
Student	1 (1.5%)	0 (0.0%)	
Father Occupation			
Agricultural Work	10 (14.7%)	1 (3.1%)	0.170
Expired	1 (1.5%)	0 (0.0%)	(Not Significant)
Other Work	57 (83.8%)	31 (96.9%)	
Mother Education			
Educated	61 (89.7%)	30 (93.8%)	0.776
Illiterate	7 (10.3%)	2 (6.3%)	(Not Significant)
Father Education			
Educated	65 (95.6%)	32 (100.0%)	0.563
Illiterate	3 (4.4%)	0 (0.0%)	(Not Significant)
Source of Drinking Water			
Tap Water	64 (94.1%)	31 (96.9%)	0.922
Hand Pump	4 (5.9%)	1 (3.1%)	(Not Significant)
Haemoglobin			
Anaemic	40 (58.8%)	10 (31.3%)	0.010
Non Anaemic	28 (41.2%)	22 (68.8%)	(Significant)

Table no. 4 shows that the relationship of Mean Corpuscular Volume and Red Cell Distribution Width between different levels of Anemia. 50 were anaemic and 50 were non anaemic. Out of 50 children were anemic including 17 (34.0%) in the Mild Anemic, 21 (42.0%) in the Moderate anemic and 12 (24.0%) in the severe anemic. The chi-square test showed that there is statistically significant difference between Iron deficiency anemia by haemoglobin levels.

Table No. 4: Relation of Anemia with category of MCV and RDW.

Variable / Group	Haemoglobin				P Value
	Normal (≥ 11 g/dl)	Mild Anemia (10 - 10.9 g/dl)	Moderate Anemia (8 - 9.9 g/dl)	Severe Anemia (≤ 8 g/dl)	
MCV < 70 fL	19 (38.0%)	10 (58.8%)	15 (71.4%)	9 (75.0%)	0.019 (Significant)
MCV ≥ 70 fL	31 (62.0%)	7 (41.2%)	6 (28.6%)	3 (25.0%)	
RDW ≤ 14.5	28 (56.0%)	11 (64.7%)	19 (90.5%)	10 (83.3%)	0.023 (Significant)
RDW > 14.5	22 (44.0%)	6 (35.3%)	2 (9.5%)	2 (16.7%)	

Discussion

Lead pollution is substantial health problem in a developing country like India. The effect of lead on haematological system results inhibition of heme biosynthesis in anemia. This study, a hospital bade prospective study of blood leads levels in children with anemia include analysis of blood lead levels in 100 children.

In our study, Approximately half of the children in this study had haemoglobin> 1 g/dl, which is similar to previous estimate made for children [12,13].

In our study, out of 50 children with anemic, 46 (92.0%) children had drinking water source from tap water, 4 (8.0%) children had source from hand pumps but there was no statistical significance.

In the study done by Jain et. al. [14] and Amal et. al. [12] .children with higher blood lead levels had consumed piped water but there was no statistical significance.

In our study, out of 53 children with Iron deficiency by Mean corpuscular volume < 70 fL, 34 (64.2%) were anemic and 19 (35.8%) were non anemic. Out of 47 children with MCV > 70 fL, 16 (34.0%) were anemic and 31 (66.0%) were non anemic. Also there was statistically significant difference with Iron deficiency anemia in relation to MCV.

In our study, Out of 68 children with Iron deficient by Red Cell Distribution width > 14.5, 40 (58.8%) were anemic and 28 (41.2%) were Non anemic. Out of 32 Children with RDW < 14.5, 10 (31.3%) were

anemic and 22 (68.7%) were Non anemic. Also there was statistically significant difference between Iron Deficiency anemia in relation to RDW.

Ahmed et al [15] concluded that lead exposed iron deficient children had significantly higher blood lead levels as compared to control and observed that iron deficiency combination with lead exposure synergistically elevates blood lead levels and susceptibility to its harmful effects in children is seen. Also indicated that elevated blood lead levels (> 10 mcg/dl) in children were significantly associated with risk of anemia.

In our study, Out of 50 children were anaemic including 17 (34.0%) in the Mild Anemic, 21 (42.0%) in the Moderate anemic and 12 (24.0%) in the severe anemic. The using chi-square test showed that there was statistically significant difference between Iron deficiency anemia by haemoglobin levels.

Conclusion

Prevalence of Iron Deficiency anemia by MCV and RDW was 64.2% and 58.8%. However a significant difference between the anemic and Non anemic group regarding MCV and RDW. Lead levels were measured and higher lead levels >10 mcg/dl noted.According to the study, there is minimal lead exposure and no lead toxicity in this area.

Abbreviations:

IDA - Iron Deficiency Anemia

RBC - Red blood cell count

Hb- Hemoglobin

Hct- Hematocrit

MCV-Mean corpuscular volume

MCH - Mean corpuscular hemoglobin

MCHC-Mean corpuscular hemoglobin concentration

RDW- Red cell distribution width

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

Source of Funding- Self

Conflicts of Interest- Nil

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A Study to Assess Occupational Stress among Farmers Residing in a Selected Rural Area of Rahata Taluka, Ahmednagar District

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Abstract

Background: During the recent years, farming has gone through lot of changes and it also found to be one of the potential areas for stress. Along with irregularities in weather and financial issues; greater use of automation technology, more use of organic production, decrease price for agricultural products and new complicated legislations have made the life of farmers more stressful one. In this study an attempt is made to find out the factors which are causing stress and made the life of farming community more miserable.

Materials and Methods: A descriptive design with cross-sectional survey approach was used to collect the data. A modified version of farm stress inventory created by James & Lily Walker was used to assess the occupational stress. The samples were selected by purposive sampling technique. The samples comprised of 60 farmers of a selected village of Rahata taluka Ahmednagar District Maharashtra. Descriptive and inferential statistics were used for data analysis.

Results: The findings of the study revealed that majority of the participants had occupational stress in each area of assessment (Financial stress, farming hassles, weather stress, work overload and other people as stressor)

Conclusion: study concluded that farming hassles and financial stress was common and more significant type of stress among most of participant participants.

Keywords: *Farmers and occupational stress (Financial stress, farming hassles, weather stress, work overload and other people as stressor)*

Introduction

Globally agriculture occupation has been described as one of the most hazard-prone occupations. This industry has one of the worst records for high incidence of occupational ill health, injuries and work related fatalities. Farming community weather stress will be more considerable as compared to other components of stress[1]

Mcgregor, Willock et al conducted a study to assess farmers stress indicated that five stress related domains predominate in farmers. The first was "economics" including loan repayments and government agricultural policies. The second domain was "geographical isolation "and recorded the farmers distance from services. Third domain was "time pressure" indicated the experience of having too much to do in little time. The fourth domain was "climatic conditions" adducing information about rainfall, frost and wind erosion. The fifth domain was "hazardous

working conditions" which enquired about chemicals. The data analyzed in this study was collected via a survey of farmers. The result was highest stressors with mean scores of 3.3 (where 1 indicated no stress and 5 very severe stress) were found to be filling government forms, adjusting to new government regulations and poor weather conditions[2]

Study conducted by Dr Jane parry, Dr Helen Barnes et al explored the ways in which stress affect farming communities, how this has changed in recent years and degree to which work related aspects of stress may be assuaged by support interventions. A qualitative case study research approach was employed to address these issues, involving 60 interviews in five locations across England and Wales. In examining farming stress a distinction was made between its intrinsic, extrinsic and work related dimensions. While interviewees tended to associate day- to-day worries and acute stress with farming's intrinsic demands (such as disease and adverse weather conditions), external causes of tension (such as competition and regulation), together with worries about finances and family were associated with more sustained anxieties[3]

Agriculture with its allied sectors is the largest source of livelihoods in India. 70% of the rural households still depend primarily on agriculture for their livelihood with 82% farmers being small and marginal[4]

As per the report of free Press journal A 42 year old farmer from Kusadgaon in Jamkhed tehsil of Ahmedgar district in state of Maharashstra committed suicide by hanging himself who was having one and half acres of agriculture land and he had taken loan of 1.5 lakh State bank of India and could not repay it, another farmer who was 60years old from Parbhani district of Maharashtra ended his life by hanging himself, he also had taken loan from bank as well as from private money lender, which he was unable to repay.[5]

A community based descriptive cross sectional study conducted in Aurangabad district of Maharashtra revealed that farmers experiencing unpredictable weather and financial problems as major stress factors. The study also revealed that differences of stress levels on various factors were statistically significant when compared to size of landholding of farmers-small farmers were more susceptible. This study concluded that weather fluctuations and unpredictability leads to significant effects on production of crop and which is directly related to the annual income of farmers; hence policymakers, agricultural scientists marketing and financial experts need to create a suitable environment for farmers to overcome these stressors[6]

A descriptive study conducted have clearly indicated that the farming occupation leads to stress due to financial, weather, work overload, social interaction and farm hassles. It is inferred that all the selected dimensions are producing either high or medium level of stress to farming people. It is also found that stress due to financial factors is found to be slightly higher than other stresses[7]

Methodology

The purpose of this study was to assess the level of occupational stress among farmers residing in a selected rural area of Rahata taluka. The descriptive study design with cross-sectional survey approach was used to collect data. Total 60 farmers were selected as per inclusion and exclusion criteria with purposive sampling technique. Data collection was done on 5 point likert scale with a modified version of farm stress inventory created by James & Lily Walker. Tool was divided into five components as financial stressors, farming hassles, weather related stressors, work overload ad others as stressors to assess the occupational stress.

Prior permission was obtained from concerned local authority of a selected village of Rahata Taluka . During data collection, the researcher introduced himself to the respondents and their willingness for the participation was ascertained. The respondents were assured that the confidentiality of the information will be maintained. The informed consent was obtained from the respondent before the data collection. The researcher himself collected data from each subject with interview technique. The data collected from each subject was recorded systematically and organized in a way that facilitated computer entry and data analysis.

Findings

Findings related to demographic profile: Most of the farmers (26.66%) were in the age group of 41-50 years. The study was dominated by male farmers (100%). Majority of study subjects (60%) were with secondary school education and only 8% were with no formal education. Most of the farmers (88.33%) were married and 11.66% were unmarried. 80% of farmers were Hindu by religion and 3.33% belonged to Christian community. Majority of the participants (90%) had source of income other than farming only 10% were fully dependent on farming for their livelihood. 40% of the participant's per capita monthly family income was Rs. 3287-6573 and 8% of the participants had monthly per capita income of Rs 986-1971. 86% of the farmers were residing in Pakka house and 14% were residing in Kaccha type of house. 48% of the farmers were living in nuclear families followed by 35% and 165 were residing in joint and extended joint families respectively. Majority of farmers (56%) had more than three dependents in family only 5% had one dependent in their families. 58% of the farmers had priority responsibility of higher education of their children followed by 25.66% had priority responsibility of marriage of their daughters.

Findings related to agricultural Characteristics: majority of the participants (43.33%) had more than four acres of agricultural land and 10% of the farmers had only 1-2 acre of agricultural land. 73% of farmers had no irrigation facilities and 27% farmers had irrigation facilities available for farming. For 86% of the farmers had irregular and inadequate electricity supply for farming related work. Crop seeds were easily available for 90% of farmers only 10% had difficulty to get it. 86.66 % of the farmers were regularly using pesticides and 13.33% were sometimes using pesticides. Own farming equipments were available for 31.66% of farmers and 31.66% were borrowing farming equipments on rent basis. For 86% study participants ferlizers were easily available and for 20% it was difficult to get it. 40% of the participants preferred to have mixed type of crop yielding and 13.33% were yielding horticultural crop. 35% of farmers had personal borrowing followed by 26% had self financed farming and 18.33% took loan from bank. 40% of the faced recent crop failure. Crop Storage facility was unavailable with the 73.33% study participants and for 26.66% participants it was available.

Major findings of the study: In the financial component 50.8% study participants had low, 28.3 had moderate and 20.8% had severe level of stress. In farming hassles component 81% respondents were having low level of stress followed by 18.3% with moderate level of stress. In weather stress component 25% were having severe, 33.3% were having moderate and 41.6% had low level stress. In work overload component of stress 70% subjects had low, 26% had moderate and 3.3% had severe level stress. Other people as low level of stress was experienced by all the participants (100%)

Financial Stress

Levels of stress:
- Severe — 20.80%
- Moderate — 28.30%
- Low — 50.80%

Percentage (X-axis: 0.00%, 10.00%, 20.00%, 30.00%, 40.00%, 50.00%, 60.00%)

Farming hassels Stress

- Low — 81.60%
- Moderate — 18.30%
- Severe — 0%

Levels of Stress

Weather Stress

Low Moderate Severe

- 42%
- 33%
- 25%

Work Overload Stress

- Low
- Moderate
- Severe

3%
27%
70%
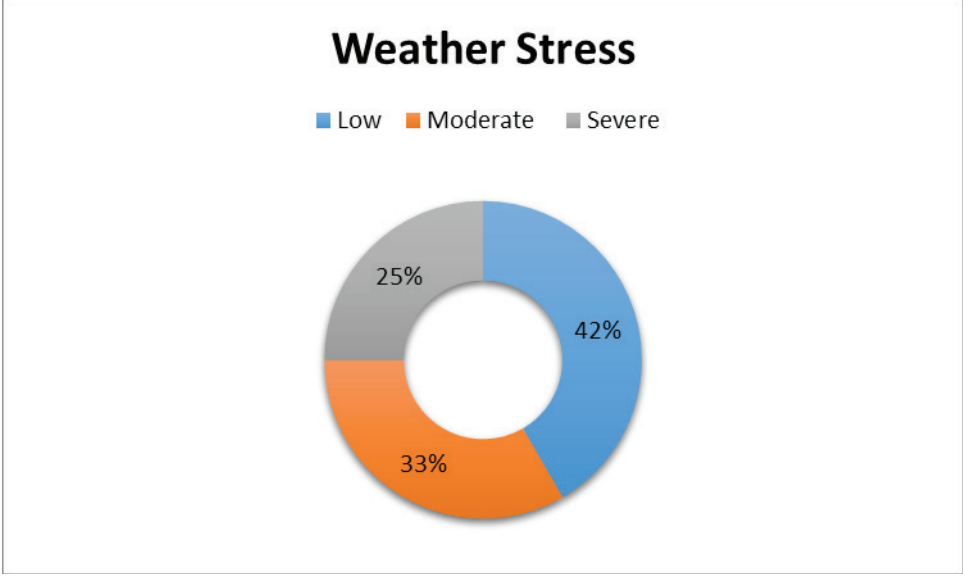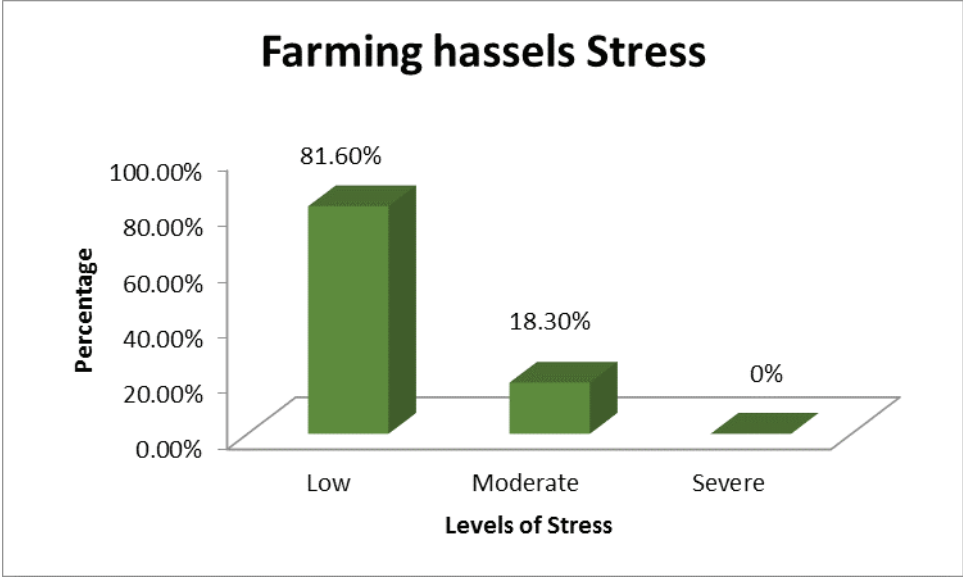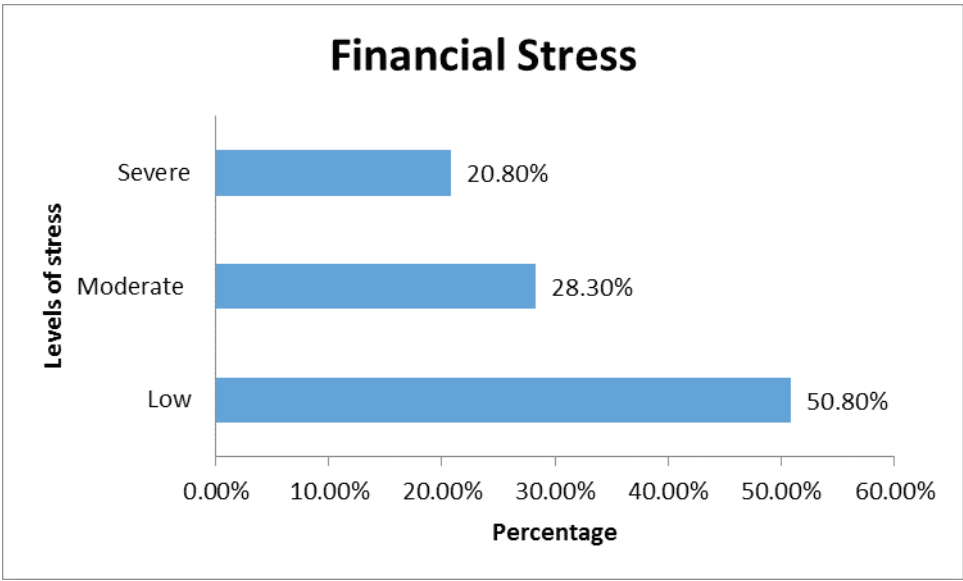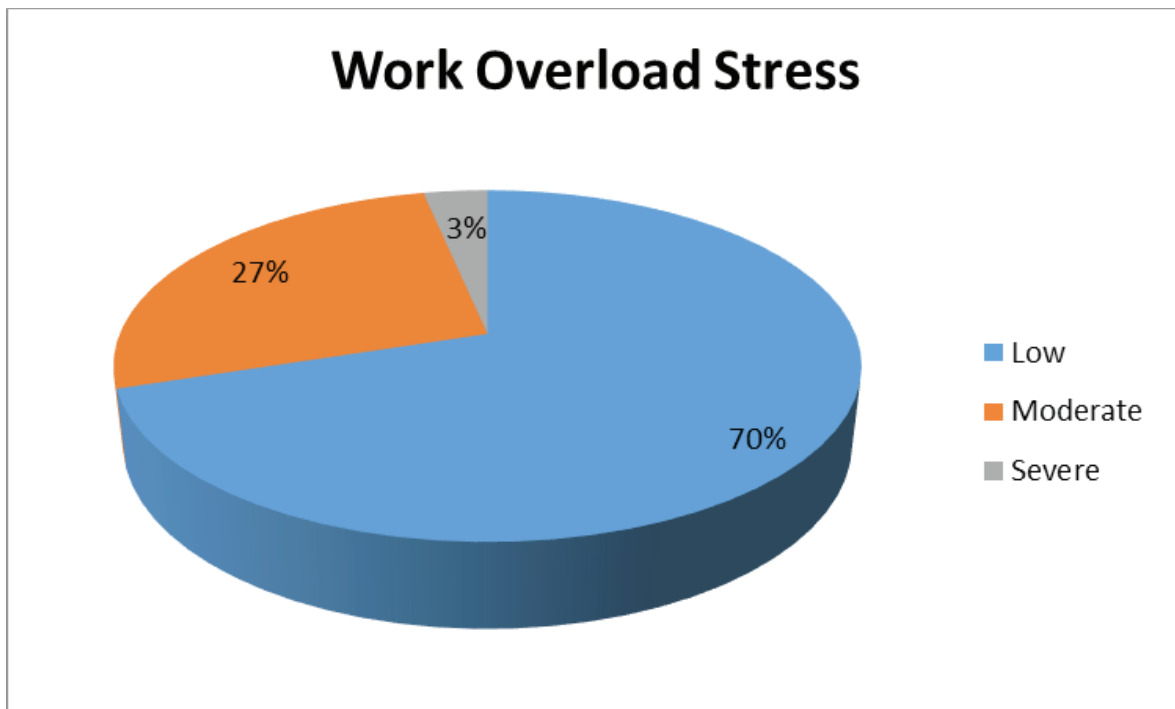
Discussion

In the Present study majority of the participants were with (60%) secondary school education, this finding is supported by the study conducted to assess potential sources of stress for farmers in England and Wales[8]

The study conducted to assess role of financial threat, social support, work stress and mental distress among farmers in Ireland shows that 97% of the participants were male[9]; in the present study all the participants (100%) were male.

Study conducted to assess the risk factors affecting farmers mental health, the findings of the study showed that 58% of the farmers had more than three dependents in family[10] however in present study 56% of participants had more than three dependents in family.

Study conducted to assess burnout and hopelessness among farmers; findings of this study showed that majority (70%) of farmers had recent crop failure[11] where as in present study recent crop

failure was faced by 40% of the farmers.

A study conducted to assess stressors among farmers in eastern North Carolina indicated that 88% of farmers were having source of income other than farming and majority of farmers (76.46%) were not having storage facility for yielded crop[12] where by present study revealed that 90% of the participants have source of income other than farming and for 73.33% participants storage facility is not available for yielded crop.

Present study indicated that most of farmers had low to moderate level of stress in all the areas of assessment (financial stress, farming hassles, work overload, weather stress and other people as stress) only few percentage of the farmers were having severe occupational stress study conducted by Dr Javed Kureshi on occupational stress among farming people in Aurangabad district of Maharashtra, the findings of this study showed that the farming occupation encompasses all type of stresses to farmers, the study are farmers were experiencing unpredictable weather and financial problems as major stress factors[6].

Recommendations:

1. Same studies can be conducted on larger no of samples to generalize the findings

2. Interventional Programmes to be initiated to develop coping abilities of the farmers

3. There should be Proper implementation of welfare schemes related to farmers.

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The Relationship between Proinflammatory Cytokines, Trait Mindfulness, and Psychological Well-Being in Rheumatoid Arthritis

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Abstract

Background: Rheumatoid arthritis(RA) is an autoimmune disease in which the body's immune system starts attacking its own cells especially, joints. Individuals with RA are 3 times more susceptible to depression and anxiety. Mindfulness-based interventions have been found efficacious in decreasing depressive symptoms and increasing psychological well-being(PWB) in this population, but the relationship between trait mindfulness and PWB with proinflammatory cytokines implicated in RA has not been explored to date.

Objective: This study aimed to understand the relationship between proinflammatory cytokines, trait mindfulness, and psychological well-being in rheumatoid arthritis patients.

Method: The study consisted of a total of 16 individuals from the 45-75 years age group who have been diagnosed with RA, taking treatment from Kasturba Medical College, Manipal. Proinflammatory cytokines in saliva, IL-6 and TNF-α levels were measured using an ELISA kit, and scales were administered to measure trait mindfulness, psychological well-being, and functioning. Descriptive analysis was done to study the relationship between the variables.

Results: A significant increase in IL-6 levels were observed in the present study, while TNF- α levels were within normal limits. 50% of the participants reported severe impairment and 75% reported depressive symptoms. These results provided evidence of a strong correlation between IL-6 levels and depression. There was a strong positive correlation between trait mindfulness and psychological well-being, $(r(14)=.71, p*.01)$. Trait mindfulness however had a moderately negative correlation with depressive symptoms and disability. Moreover, the relationship between psychological well-being and depressive symptoms and disability was not significant. The relationship between depressive symptoms and disability was highly significant, $(r(14)= .63, p*.01)$.

Discussion and Conclusion: People with RA experience difficulty carrying out everyday tasks and tend to suffer from depression. However, people who score high on Mindfulness and PWB experience less depression and face less interference in their daily activities. Thus, interventions that promote mindfulness practice and psychological well-being may prove to be effective in decreasing depressive symptoms in RA patients as well as proinflammatory cytokines.

Keywords: Proinflammatory cytokines, Psychological well-being, Rheumatoid arthritis, Trait mindfulness.

Introduction

Mindfulness originated in Eastern traditions and is linked with the practice of meditation**.** It is the ability to be in the present moment, with purpose and a non-judgemental attitude[19], which facilitates a sense of well-being and the ability to flexibly adapt to changing circumstances[21]. Mindfulness works by facilitating characteristics such as acceptance, decentring, and psychological and behaviouralflexibility[14]. Decentring helps in tackling cycles of ruminative processes which are characteristics of major depression. Deployment of conscious awareness also reduces ruminative thinking by occupying limited attention resources available to us[27]. Mindfulness decreases the impact of stressors[12], by increasing engagement of positive self directed strategies for coping rather than indulging in automatic, negative habitual patterns of responding to a stressor[7]. Mindfulness based Interventions are also found to be effective in increasing the immune function by better regulating the HPA axis[10], which was dysregulated by glucocorticoid receptor resistance caused by prolonged stressors[9].

Another variable that has been found efficient in improving body immune response by decreasing the effect of stressors is Psychological well-being(PWB)[1,6]. PWB components such as positive mood states and favourable social and personal functioning, strengthens the psychological balance[13],and enhances resistance towards disease, and make life more prosperous[1]. Present study aims at studying the relationship between those two variables and their relationship with the immunity biomarkers implicated in rheumatoid arthritis.

RA affects approximately 1% of the population in India[18],and an estimated 0.3 to 1% population worldwideaccording to WHO. It is an autoimmune disease in which the body's immune system starts attacking its own cells especially, joints. This results in inflammation that causes the joints (the synovium) to thicken, which results in swelling and pain in and around the joints[18]. Till now, the actual cause of RA is not clear, but many studies have indicated that proinflammatory cytokines lead to cartilage and bone destruction in RA[3,15]. Cytokines such as Tumor necrosis factor alpha(TNF-α) and Interleukin- 6(IL-6) are found to have a critical role in RA[30].

These patients are 3 times more susceptible for depression and anxiety[22] and RA has a significant impact on functioning[8], social interactions[16], and relations with family members[25], adding further to the disease burden. Mechanisms responsible for the prediction of RA by pre-existing depression are not clear, but altered immune functionality could be the shared mediating factor[20]. Understanding the relationship of trait mindfulness and PWB with immune biomarkers and functioning in rheumatoid arthritis patients will be helpful in devising adjunct treatments methods for the management of stress, depressive symptoms, and improving functioning in these patients. Thus, the present study aimed to study the relationship between proinflammatory cytokines, trait mindfulness, psychological well-being and functioning in RA patients.

Method

Participant characteristic

Sample of the current study consisted of 16 participants(13 female) from the age group of 45-75, who have been diagnosed with RA and have been taking treatment from the department of medicine, Kasturba medical college, or from the Department of Ayurveda, Manipal academy of higher education. All the participants were residents of Karnataka, who can either speak Kannada or English.

Sampling procedure

The sample of the study was obtained by using a

convenience sampling method. Individuals diagnosed with RA were approached and were required to fulfill the following inclusion criteria: Individuals between the ages of 45-75 years, individuals of either gender,who can read and speak either Kannada, Hindi or English. Individuals were excluded from participation if they fulfilled criteria of a comorbid psychiatric disorder(excluding depression and anxiety) as screened on modified MINI-International Neuropsychiatric interview[2]; individuals with severe disabilities as assessed on the Global Disability scale[17]; Individuals who underwent mindfulness, yoga, and another traditional form of intervention two months before being selected for the study; individuals with intellectual disability as ruled out clinically; active self-reported alcohol and other drug dependency; scheduled for major surgery; Individuals with other major medical illness. Screened individuals who were willing to take part in the study were given a consent form and were recruited.

Procedure

Individuals were approached and were oriented about the study and were informed that participation is voluntary and participants can leave the study whenever they want. Afterward, interested participants were screened according to the inclusion and exclusion criteria and 7 individuals were excluded as 2 did not meet the age criteria, 3 had other comorbid conditions such as Hypertension, Chronic heart disease and 2 could not read either in Kannada or English. Then written consent from the screened-in individuals was taken and a form to collect demographic details(Age, gender, residence, education, marital status, occupation, and duration of illness) was filled by the participants. Scales to measure trait mindfulness, psychological well-being and functioning were administered in the department of Clinical Psychology. Then Unstimulated saliva samples were obtained from all the participants. Participants were instructed

to brush their teeth, not to eat at least 2 hours before sample collection. They were asked to make chewing motions for 30 seconds to stimulate salivary flow. Subjects were then instructed to first swallow, tilt their head forward, and spit 5ml of unstimulated saliva into a small chamber. Saliva samples from participants were taken at the department of biochemistry, to measure proinflammatory biomarkers(TNF-α, IL-6), which then were assessed in the Biochemistry lab, Department of Biochemistry. Study was carried out from 10th september, 2019 to 30th April, 2020

Study tool: The Five Facet MindfulnessQuestionnaire (FFMQ)[5] gives scores on total mindfulness and its five facets: observation, description, aware actions, non-judgemental inner experience, and non-reactivity. Psychological well-being scale-shorter version[26] was used to measure PWB. Global disability index[17] is a self administered measure and was used to measure overall disability and day to day functioning. Self-reporting questionnaire-24(SRQ-24) was developed by WHO to screen for mental illness and was used to measure depression and anxiety. All the tools were translated into Kannada by experts.

Statistical Analysis

A statistical package for social sciences(SPSS version 25) was used to analyze the data and descriptive analysis was used. Pearson correlation test was used to study the correlation between trait mindfulness, PWB, and disability. The Spearman rank test was used to study the correlation of trait mindfulness and PWB with functioning.

Results

Socio-demographic characteristics:

The socio-demographic characteristics of the participants are mentioned in table 1.

Table 1: Demographic details of participants

Characteristic

Mean age(years)	
Male	60 Years 7 months
Female	60 Years 2 months
Gender ratio(F/M)	4.3: 1
Education level	5th Std and above
Mean duration of Illness	9 years 11 months

Proinflammatory levels

Participants' IL-6 and TNF-□ serum levels are presented in Table 2.

Table 2: *Proinflammatory marker levels*

Participants	TNF-□(pg/ml)	IL-6(pg/ml)
1	27	123
2	146	266
3	5	98
4	1	629
5	1	142
6	23	98
7	1	194
11	94	228
16	1	283
Mdn	5	194
Interquartile range	59.5	164

Relationship between mindfulness, psychological well-being, functioning and disability

Individual scores on FFMQ, PWB scale, SRQ-24, and global disability scale are presented in table 3. Overall PWB and mindfulness were found to be strongly positively correlated, $r(14)=.71$, $p<.01$. Depressive symptoms and disability were found to be strongly positively correlated, $r(14)= .63$, $p<.01$.

Mindfulness and disability were found to have a moderate negative correlation, $r(14)=-.58$, $p<.05$. mindfulness and depressive symptoms were found to have a moderate negative correlation, $r(14)= -.40$, $p=.12$, but the findings were insignificant. PWB and disability were found to be moderately negatively

correlated, r(14)=-.49, p=.053, but the scores were insignificant. PWB and depressive symptoms were found to be moderately negatively correlated, r(14)=-.47, p=.067, but the scores were insignificant.

Table 3: Mean scores on different scales

Variables	Participant																Mean	SD
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
FFMQ-total	139	89	91	158	84	72	146	134	135	150	103	72	90	145	126	167	118.8	32.19
Scale 1	33	22	22	34	21	14	40	33	31	30	25	18	19	30	27	32	26.94	7.08
Scale 2	33	19	23	30	20	23	33	28	28	38	15	17	18	36	29	39	26.87	7.68
Scale 3	30	16	16	39	16	14	28	28	30	28	23	14	22	34	27	39	25.25	8.37
Scale 4	24	16	16	39	13	8	21	20	20	28	24	12	18	20	18	31	19.87	6.30
Scale 5	19	16	14	36	14	13	24	25	25	26	16	11	12	25	25	26	6.30	5.96
PWB-total	161	130	135	193	118	164	219	116	127	209	156	117	101	210	187	216	159.94	40.84
Disability	37	59	45	47	50	56	27	40	51	34	32	70	61	49	63	40	47.56	12.18
Functioning	13	11	14	6	15	13	3	14	14	6	6	16	14	10	17	15	11.69	4.24

Discussion

The current study was conducted to study the relationship between biomarkers implicated in rheumatoid arthritis, trait mindfulness, psychological well-being, and functioning in rheumatoid arthritis patients. A total of 16 individuals diagnosed with rheumatoid arthritis were part of the study out of which 13 were females, as more females are affected by RA than males[3]. The mean duration of illness was 9 years 11 months, which depicts the chronic nature of RA. On the Global disability scale, 50% of the participants reported severe disability, which indicates that RA significantly affects individuals' physical functioning and daily activities. On SRQ-24, 75% of the individuals reported depressive symptoms, adding further to the disease burden.

IL-6 level values were higher than the control(31pg/ml) indicating compromised immune functioning, supporting the previous research that IL-6 is implicated in the pathogenesis of RA[3,15,23,29]. Elevated IL-6 levels could also be due to significant stress experienced by these patients due to chronic pain, decreased functioning, depressive symptoms[11,28], and aging [32]. TNF-□ values were found to be elevated in 5 out of 9 individuals, but the difference was not significantly different from the control value(15 pg/ml). Our results are not consistent with the previous literature where TNF-α levels were found to be elevated in individuals with RA[31]. One possible explanation is that these individuals have been taking treatment for a long time and with medicines, the disease activity was under control.

One of the objectives was to explore the relationship between trait mindfulness and PWB, and findings indicate that trait mindfulness and PWB had a strong positive correlation. This means that individuals with high trait mindfulness experience good positive PWB and vice versa, as established in the previous studies[21, 24]. Mindfulness was also found to have a moderate negative correlation with both disability and

depressive symptoms, which indicates that individuals with higher scores on trait mindfulness reported lesser symptoms of depression, and faced less difficulty in carrying out activities of daily living. Another objective was to study the relationship of PWB with disability and functioning. PWB was found to have a moderate negative correlation with both disability and depressive symptoms, which indicates that individuals with higher scores on PWB reported fewer symptoms of depression and anxiety, and faced less interference in carrying out activities of daily living.

Depressive symptoms were found to have a strong positive relationship with disability, which indicates that RA patients with higher scores on depression experienced more difficulty in carrying out activities of daily living.

Conclusion

This study concludes that individuals with RA are more susceptible to depression and face significant difficulty in carrying out activities of daily living. The current study failed to conclude whether the elevated IL-6 levels were due to the direct effect of rheumatoid arthritis or due to higher levels of stress and depressive symptoms experienced by these patients. Individuals with higher scores on Mindfulness and PWB report fewer depressive symptoms and face less interference due to RA in carrying out everyday work.

Findings indicate that interventions aimed at improving mindfulness skills and psychological well-being might prove to be effective in decreasing the depressive symptoms and proinflammatory cytokines in the RA population, which can be tested in future studies.

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Role of Radiology in Mucormycosis: Recent Trends

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Abstract

Background and Objectives: The purpose of this study was to describe common radiographic patterns that may be useful in predicting the diagnosis of rhinocerebral mucormycosis. **Methods:** We retrospectively evaluated the imaging and clinical data of four males and one female, 3 to 72 years old, with rhinocerebral mucormycosis. **Results:** All the patients presented with sinusitis and ophthalmological symptoms. Most of the patients (80%) had isointense lesions relative to brain in T1-weighted images. The signal intensity in T2-weighted images was more variable, with only one (20%) patient showing hyperintensity. A pattern of anatomic involvement affecting the nasal cavity, maxillary sinus, orbit, and ethmoid cells was consistently observed in all five patients (100%). Our series demonstrated a mortality rate of 60%. **Conclusion:** Progressive and rapid involvement of the cavernous sinus, vascular structures and intracranial contents is the usual evolution of rhinocerebral mucormycosis. In the context of immunosupression, a pattern of nasal cavity, maxillary sinus, ethmoid cells, and orbit inflammatory lesions should prompt the diagnosis of mucormycosis. Multiplanar magnetic resonance imaging shows anatomic involvement, helping in surgery planning. However, the prognosis is grave despite radical surgery and antifungals.

Keywords: *Rhinocerebral mucormycosis, imaging findings, MRI, neuroradiology*

Introduction

Rhinocerebral mucormycosis is an acute, fulminant, and often lethal opportunistic infection typically affecting diabetic or immunocompromised patients.[1] It is caused by one of the members of the mucoraceal family, including ***Absidia, Mucor,*** and ***Rhizopus***.[2] Clinically, presenting symptoms are nonspecific including headache, low-grade fever, facial swelling, and orbital or paranasal sinus syndrome. After infection of the nasal cavity and paranasal sinuses, the fungi cause a necrotizing vasculitis that extends rapidly into deep face, orbits, cranial cavity, and brain through skull base partitions and foramina.[2] When limited involvement of the paranasal sinuses is present, survival rates are between 50% and 80%.[3] However, when brain invasion has occurred, mortality is greater than 80%. Because of its lethal nature, it must be recognized early and treated aggressively. We retrospectively reviewed the neuroimaging findings in a series of five patients with rhinocerebral mucormycosis to establish common radiographic patterns that may be useful in predicting the diagnosis of this infection.

Methods

We evaluated the imaging and clinical data of four males and one female, 3 to 72 years old, with mucormycosis of the craniofacial areas. Patients were selected for study if the diagnosis of mucormycosis was established by means of biopsy, culture, or autopsy, and computed tomography (CT) scans or magnetic resonance (MR) images were available for

review. All the patients were immunosuppressed. Two had diabetes mellitus, and four had hematologic conditions and concomitant immunocompromised states. All patients had MR imaging with a 1.5-T system. Both T1- and T2-weighted images were obtained as well as T1-weighted images after intravenous injection of gadopentetate dimeglumine (0.1 mmol/kg). Four patients had CT scans available for review.

Images were evaluated for density, signal intensity, and contrast enhancement characteristics. The CT density was evaluated in non-enhanced images and compared with muscle/brain. The MR signal intensity was compared with gray matter on the T1- and T2-weighted images . Gadolinium enhancement was graded on a scale from none to marked. All studies were reviewed by two neuroradiologists (DAH, ABD), and the anatomic structures involved by the infection were defined by consensus. Clinical information about the presentation, management, and evolution of disease was obtained from medical history in all cases.

Results

Clinical Presentation

All the patients presented with sinusitis and ophthalmological symptoms. Three patients (60%) had clinical symptoms of cavernous sinus involvement including diplopia/ophthalmoplegia and facial pain/numbness.

Computed Tomography Findings

Of the four patients who had CT scans available for review, 3 (75%) had isodense to muscle/brain lesions. Only one patient (25%) had hyperdense lesions relative to muscle/brain in the noninvasive portion suggesting secondary obstructive changes (inspissated secretions).

Magnetic Resonance Imaging Signal Intensity

Most of the patients (80%) had isointense lesions relative to brain in T1-weighted images. The signal intensity in T2-weighted images was more variable, with only one (20%) patient showing hyperintensity. The rest of the lesions were either hypointense or isointense in long retention time images .

Enhancement Pattern

One patient (20%) didn't have enhancement of his inflammatory process after the administration of gadolinium. Two patients (40%) had variable enhancement, with mixed non-enhancing and marked enhancing portions of their inflammatory lesions. One patient (20%) had mild enhancement and the remaining patient (20%) had no enhancement at all. Dural enhancement was observed in two patients (60%) and mixed leptomeningeal and pachymeningeal enhancement was present in another patient (20%).

Clinical Evolution

Orbital exenteration, ethmoidectomy, medial maxillectomy, and debridement of the nasal vault were performed in all patients. More extensive debridement of necrotic tissue was performed as required in each particular case according to surgical findings . All patients received amphotericin-B locally and parenterally. Two patients (40%) recovered, while three patients (60%) expired.

Discussion

Mucormycosis, also known as zygomycosis and phycomycosis, was first described by Paulltauf in 1885.[4] Phycomycetes are ubiquitous fungi occurring in soil, air, skin, body orifices, manure, spoiled food, and dust.[5,6] Inoculation occurs by inhalation, when spores reach the nasal cavity and/or nasopharynx. The fungus may then spread to the paranasal sinuses and subsequently to the orbit, meninges, and brain by direct extension.[7] Orbital involvement results

from spread through the nasolacrimal duct and medial orbital wall. Such invasion is facilitated by the thinness of the lamina papyracea, congenital dehiscence often present along the medial wall, and the perforations of the medial wall by arteries and veins.[8,9] Mucormycosis invades the walls of the blood vessels resulting in vascular occlusion, thrombosis, and infarction, as well as dissemination to the central nervous system from the primary focus.[5,10,11] Spread to the brain may occur via the orbital apex, orbital vessels, or via the cribriform plate.[12] Generally, the presenting symptoms are low-grade fever, cephalgia, sinusitis, facial swelling, orbital apex syndrome with blurred vision, and cranial palsies from cavernous sinus involvement in an immunocompromised patient.[13,14,15] Early visual loss would favor the diagnosis of rhino-orbital-cerebral mucormycosis over bacterial cavernous sinus thrombosis in which blindness is a much later finding.

We found that MRI signal intensity of mucormycosis lesions tends to be isointense or hypointense in all sequences. After the administration of gadolinium the lesions had variable enhancement patterns ranging from homogeneous to heterogenous or non-enhancing at all. We think that contrast-enhanced T1-weighted images are helpful in delineating the intracranial spread when meningeal enhancement is present as well as in identifying invasion of the cavernous portion of the internal carotid artery by the disease. This had been previously described by Mohindra and associates who showed that MRI can detect cavernous sinus invasion and vascular complications such as ischemia.

Conclusions

Progressive and rapid involvement of the cavernous sinus, vascular structures, and intracranial contents is the usual evolution of rhinocerebral mucormycosis. Multimodality imaging is helpful in prompting an early diagnosis when a pattern of nasal cavity, maxillary sinus, ethmoid cells, and orbit inflammatory process is present, especially when iso- or hypointense lesions are observed. Multiplanar MRI shows anatomic involvement, which helps in surgery planning. However, the prognosis is grave despite radical surgery and antifungals.

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Influence of Badminton Skills Training on Selected Bio-Motor and Skill Performance Variables of College-Level Students with Hearing Impairment

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Abstract

The purpose of the study is to find out the influence of badminton skills training on selected bio-motor and skill performance variables of college-level students with hearing impairment. Participants: To achieve the purpose of the study 12 college students with hearing impairment from Ramakrishna Mission Vidyalaya Industrial Training Institute, Coimbatore was randomly selected as subjects. The subject's ages ranged from 15 to 21 years. Parameters: For this study, Badminton skills training was selected as an independent variable. Bio Motor parameters namely speed and skill performance parameters namely short service and long service were selected dependent variables. Speed, short serve and long serve was measured by 50 meters run test, French short serve test and Poole long serve test respectively. Experimental Design and Statistical Techniques: The study was formulated as a truly random group design, consisting of a pre-test and a post-test. A paired 't' test was used to test the mean difference between the pre and post-test. In this statistical test level of significance was chosen at 0.05. The protocol of Badminton skills training: Standardized training protocol, a two days orientation was given to the subjects in which the methods and techniques of the training program were explained by using sign language interpretation and physical demonstration. The training program consisted of twelve weeks of five days each week in ninety minutes of training per day. The training schedule indicates that the training aim, drills and repetition of first to the fourth week, fifth to eight weeks and ninth to twelfth weeks. The training contains the day of the week, training aim, drills and repetition were detailly given in the schedule. Conclusion: Badminton skills training has a positive effect on speed, short serve and long serve of students with HI.

Keywords: *Badminton skill training, speed, short serve, long serve, hearing impairment.*

Introduction

The ability to perceive sound is called Hearing. A person suffering from hearing impairment has difficulty in perceiving or identifying sound clearly due to auditory problems. If the impairment is incurable, the child may need to use a hearing aid or receive a cochlear implant, depending on the nature of the lesion. With the help of appropriate auditory and speech training, even children with severe hearing impairment could gradually show improvement in response to sound[1].

According to the American Speech-Language-Hearing Association, hearing loss is classified as mild (20-40 dB), moderate (40-60 dB), severe (60-80 Db) and profound (over 80 dB loss)[2]. Causes of

hearing loss are diverse and generally include ageing, disease, noise and genetic reasons. Hearing loss may also be classified according to the timing of loss. The congenital form is present at birth or within the first few days of life. However, acquired hearing loss occurs later in life and generally after language has been acquired to some extent. when instructing individuals with hearing loss who also have other disabilities, an instructor needs to understand the unique needs and appropriate adaptations necessary for that particular individual. For example, an individual with Down syndrome or cerebral palsy may not be above to communicate the parameters of his or her hearing loss or preferred mode of communication[3].

Badminton is a racquet sport in which leaps, veers, and quick arm movements are needed[4]. The sport is played by two or four people without physical contact on a rectangle court divided into two equal areas by a net[5]. Badminton is a rapidly developing sport worldwide. There are 188 member countries in the International Badminton Federation, and there are 111 million licensed players around the world[6]. Badminton players have to perform a different movement at the time of playing a game[7].

Badminton requires specific physical conditioning in terms of motor and action controls; coordinative variables such as reaction time, foot stepping and static or dynamic balances, which are essential motor demands in this sport[7, 8]. Badminton players need optimum strength and dynamic balance at the time of rapid postural movements.

Badminton has more popularity, that it is played as a recreational activity everywhere. This is the reason for the increasing badminton among students with disabilities. If the skills of badminton are practised, they can take part in the sport. According to the needs of the students with disabilities, the game can be adapted. It is essential to focus on improvement[9].

Physical educators and coaches need to be aware of the differences between hearing impairment (HI) and normal people, and that people who are HI have unique needs. HI person without any residual hearing will not be concerned with background noise or poor acoustics, and a normal individual usually does not know sign language. A better understanding of the needs of individuals who are normal and good communication among all involved will enable physical education teachers and coaches to create a successful physical activity experience for students.

The purpose of the study was to examine the badminton skills training on selected bio-motor variables namely speed and skill performance variables namely short serve and long serve of college-level students with hearing impairment.

Materials and Methods

A. Participants

To achieve the purpose of the study 12 college students with hearing impairment from Ramakrishna Mission Vidyalaya Industrial Training Institute, Coimbatore was randomly selected as subjects. The subject's ages ranged from 15 to 21 years.

B. Parameters

For this study, Badminton skills training was selected as an independent variable. Bio Motor parameters namely speed and skill performance parameters namely short service and long service were selected dependent variables.

C. Experimental Design and Statistical Techniques

The study was formulated as a truly random group design, consisting of a pre-test and a post-test. A paired 't' test was used to test the mean difference between the pre and post-test. In this statistical test level of significance was chosen at 0.05.

A. Criterion Measures

Table – 1: Selection of test

S. No	Dependent variables	Test item/Equipment	Unit of measurement
Bio-motor variables			
1.	Speed	50-metersrun	In seconds
Skill Performance variables			
1.	Short serve	French short service test	Points
2.	long serve	Poole long service test	Points

Figure-1 indicates the procedure for short serve and long serve

B. Protocol of Badminton skills training

Standardized training protocol, a two days orientation was given to the subjects in which the methods and techniques of the training program were explained by using sign language interpretation and physical demonstration. The training program consisted of twelve weeks of five days each week in ninety minutes of training per day.

TableII, TableIII and TableIV indicate that the training aim, drills and repetition of the first to the fourth week, the fifth to eight week and the ninth to twelfth-week training schedule respectively. The training contains the day of the week, training aim, drills and repetition were detailly given in the schedule.

Table - 2

Weeks	Aim	Drills	Repetition	Set	Duration in three sets/ Drill	Total duration
1st to 4th-week training schedule						
Monday	Speed / Forehand smash	3/3	15	3	30min	90min
Tuesday	Abdominal Muscular strength / long service	3/3	15	3	30min	90min
Wednesday	Flexibility / short service	3/3	15	3	30min	90min
Thursday	Speed / Forehand smash	3/3	15	3	30min	90min
Friday	Abdominal Muscular strength / long service	3/3	15	3	30min	90min
5th to 8th week- week training schedule						
Monday	Flexibility / short service	3/3	20	3	30min	90min
Tuesday	Speed / Forehand smash	3/3	20	3	30min	90min
Wednesday	Abdominal Muscular strength / long service	3/3	20	3	30min	90min
Thursday	Speed / Forehand smash	3/3	20	3	30min	90min
Friday	Flexibility / short service	3/3	20	3	30min	90min
9th to 12th week- week training schedule						
Monday	Speed / Forehand smash	3/3	15	4	30min	90min
Tuesday	Abdominal Muscular strength / long service	3/3	15	4	30min	90min
Wednesday	Flexibility / short service	3/3	15	4	30min	90min
Thursday	Speed / Forehand smash	3/3	15	4	30min	90min
Friday	Abdominal Muscular strength / long service	3/3	15	4	30min	90min

Results of The Study

Table - 3: Badminton skills training group on speed

Group	Mean	SD	Std. The error of the mean	't'
Pre test	9.64	0.96	0.28	11.19*
Post-test	8.64	0.93	0.27	

* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 9.64 and the posttest value was 8.64 respectively. The badminton skills training group obtained 't' ratio was 11.19 was greater than the table value of 2.20. It shows that the badminton skills training group had significant speed improvement.

Table - 4: Badminton skills training group on a short serve

Group	Mean	SD	Std. The error of the mean	't'
Pre test	2.75	0.57	0.16	7.59*
Post-test	3.52	0.68	0.20	

* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 2.75 and the posttest value was 3.52 respectively. The badminton skills training group obtained 't' ratio was 7.59 was greater than the table value of 2.20. It shows that the badminton skills training group had significant improvement on short serve.

Table - 5: Badminton skills training group on long serve

Group	Mean	SD	Std. Error of the mean	't'
Pre test	2.75	0.50	0.14	10.65*
Post-test	3.54	0.51	0.15	

* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 2.75 and the posttest value was 3.54 respectively. The badminton skills training group obtained 't' ratio was 10.65 was greater than the table value of 2.20. It shows that the badminton skills training group had significant improvement on long serve.

IV. Discussion and Conclusion

The participants did not have any specific physical activities to improve their speed, due to the limitation of their hearing capacity. At the same time, they did not get any sign language interpreter to help them for increasing their fitness. Physical activities are inherent qualities of the human, subsequently, the participants got suitable opportunities to do some play activities with few adaptations and sign language interpretation. They have been involved in some short stride movements in training regiments. They were evoked to learn the movement patterns in the badminton court. These are all the reasons; the speed performance of the participants was increased significantly.

The participants actively participated in the badminton skills training, because they were new to the game. The instruction was given by the scholar also helped to practice short serve and long serve easily. The scholar prepared a comprehensive badminton skill training protocol to follow systematically. The progression of load, types of drills and exercise were prepared according to their need.

Another research concluded that progressive resistance training increases balance capacity in children with Down syndrome. The results of the current research suggest the importance of increasing muscle strength and improve balance through progressive resistance training[10]. Results indicated that the children with MR significantly improved on selected variables due to 6 weeks of training[11]. Conventional training combined with the ladder training group showed that there was a significant improvement in selected skill performance variables. These improvements occurred because of the planned systematic training program[12,13,14,15,16,17]. Repetitive training significantly improved coordination and increase smash quality[18]. Exercise training increases physical fitness, mental function in people with dementia[19]. There were insubstantial differences in performance in both ten meter and twenty-meter sprint time and multistage fitness tests[20].

To my knowledge, the present study is an innovative study that investigated the effect of badminton skills training on selected bio-motor and skill performance variables of college-level students with hearing impairment.

In conclusion, badminton skills training has a positive effect on speed, short serve and long service of students with HI. Because, play is an important activity for everyone, maybe normal or disabled.

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Study of Glycated Hemoglobin (HbA1C) biomarker among the Employees with type 2 Diabetes Mellitus in Relation to Various Other Modifiable Non Communicable Diseases Risk Factors at NSCBI Airport, Kolkata

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Abstract

Background: Diabetes is a global endemic with rapidly increasing prevalence in both developing and developed countries. In the recent years diabetes mellitus (DM) has emerged as a major public health problem worldwide with potential to develop vascular and neuropathic complications. HbA1c is an important indicator of long-term glycemic control with the ability to reflect the cumulative glycemic history of the preceding two to three months. This study is done to determine the glycemic control among the employees having diabetes and also to correlate with various other modifiable non communicable diseases (NCDs) risk factors.

Methods: In this descriptive observational study 156 diabetes mellitus patients who were identified through research study on non communicable diseases with risk factors, were subjected to glycated hemoglobin (HbA1C) biomarker study. The results were tabulated and analysed to assess the status of glycemic control and correlation with various risk factors in relation to various modifiable NCDs were made.

Results: In this study majority of the patient were in the age group of 40-60 years and 73.7% were male patients. Also 27.5% of them had coexisting hypertension, 37.8% with pre-hypertension, 61.5 % with abdominal obesity. Present study showed that 25% were in good glycemic control (HbA1c<7%), 34.6% were in fair glycemic control (HbA1c 7-9%) and 40.38% were in poor glycemic control (HbA1c (>9%). Poor gylcemic control is predominant among Smokers, Alcoholics, Obese, Hypertensive and also those having High BMI, Low Physical Activities and Unhealthy diets.

Conclusions: Present study showed that glycemic control as per HbAIc biomarker were poor among the diabetic employees and it was predominant among Smokers, Alcoholics, Obese, Hypertensive and also among those having High BMI, Low Physical Activities and Unhealthy diets and other modifiable NCD risk factors. Hence HbA1c can be used as a useful biomarker to assess the long-term control of diabetes mellitus and hence to prevent complications due to diabetes.

Key Words: *Diabetes Mellitus, Glycated Hemoglobin, HbA1C, Noncommunicable Diseases*

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Background

Diabetes is a global endemic with rapidly increasing prevalence in both developed and developing countries. Diabetes Mellitus is a group of metabolic

disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. The chronic hyperglycemia is associated with long-term damage dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels.[1] Glycated hemoglobin (hemoglobin A1c, HbA1c, A1C, or Hb1c; is also known as HbA1c or HGBA1c) is a form of hemoglobin which is measured primarily to identify the average plasma glucose concentration over prolonged periods. The glycation of haemoglobin occurs at a variable (non-linear rate) over time, during the lifespan of the red blood cell (RBC), which is of 120 days. The relative proportion of HbA1c depends on the mean glucose level over the previous 120 days.[2] The HbA1c is now recommended as a standard of care (SOC) for testing and monitoring diabetes, specifically the type 2 diabetes.[3] HbA1c is not only a useful biomarker of long-term glycemic control but also a good predictor of lipid profile; thus, monitoring of glycemic control using HbA1c could have additional benefits of identifying diabetes patients who are at a greater risk of cardiovascular complications.[3, 4] HbA1c reflects the average glucose level over the past 8–12 weeks, and is commonly used both in research and in clinical settings as a measure of glycemic control. Attaining an ideal HbA1c level demonstrates control over the disease and enables prevention of its complications. [5,6]. Target levels for HbA1c in type 2 diabetes are individual, but a general aim stated by the National Institute for Health and Excellence is 6.5–7.0% (48–53 mmol/mol). [5,7] In recent years there has been an increased focus on adverse outcomes associated with glycemic variability.[5,8,9,10] Glycemic variability can be a sign of excess glycemic excursions, and, consequently, a risk of hyperglycemia or hypoglycemia.[5,11] Greater HbA1c variability is associated with adverse outcomes in several micro- and macrovascular end-points, as well as with mortality. [5,12,13] Long-term glycemic variability is usually based on serial measurement of HbA1c, which reveals a general pattern of glycemic control over time. Previous studies indicate that HbA1c variability could possibly be superior for predicting diabetes-related complications compared to mean HbA1c.[14,15,16] Hence, considering HbA1c variability in clinical risk assessment may be beneficial. [9,10] It has been suggested that the association between HbA1c variability and diabetic complications may be explained by confounding factors, such as poor self-management or lack of support.[15,17] Level of education reflects one aspect of an individual's socioeconomic position, and is presumed to influence access to and quality of care, diabetes-related knowledge and ability to adhere to treatment regimen by turning information into health enhancing behaviors.[18] Worldwide about 415 million people are suffering from DM, which is expected to increase to 642 million by 2040. [19,20]

Methods

Study setting: This is Descriptive Observational study. The present study was carried out as part of the study "Noncommunicable Diseases and Risk Factors with special focus on Diabetes and Cardiovascular Diseases among the employees of aviation sector at NSCBI Airport, Kolkata". The primary aim of this study was to assess the status of glycemic control among the Diabetics as well as to correlate with various risk factors. The employees of NSCBI Airport, Kolkata having detected diabetes in a NCD study of 750 sample size, during the period of January 2018 to December 2018, fitting into the inclusion criteria were included in the study.

Inclusion criteria: All patients with Type 2 diabetes mellitus found in a NCD study.

Exclusion criteria: Patients with Type 1 diabetes mellitus, Gestational diabetes mellitus, Patients on long term steroids.

One Fifty Six (156) patients with Type 2 diabetes mellitus found in a NCD study of 750 sample size,

during the period of January 2018 to December 2018, were selected, based on inclusion and exclusion criteria. Diabetic patients were diagnosed according to World Health Organisation (WHO) criteria. All the study subjects were interviewed as per questionnaire underwent physical examination such as height, weight, blood pressure and the biochemical test HbA1c, the biomarker to assess the glycemic control. HbA1c was estimated by high performance liquid chromatography.

Operational Definition:

Diabetes- Individuals diagnosed by a physician and on anti-diabetic medications and or those who had fasting plasma glucose ≥ 126 mg/dl and or 2 hr post glucose plasma≥ 200 mg/dl (WHO Criteria)

Glycemic Control- Good glycemic control (HbA1c<7%), Fair glycemic control (HbA1c 7-9%) and Poor glycemic control (HbA1c (>9%) as per ICMR study.

Hypertension- BP ≥ 140/90 mmHg, Pre-hypertension- BP 120-139/80-89 mmHg, Normal- BP <120/80 mmHg (As per JNC 7 criteria)

Abdominal obesity (WC ≥90cm in males and ≥80cm in females) were defined using WHO Asia Pacific guidelines

Basal Metabolic Index (BMI) - Normal 18.5-24.99, Overweight ≥ 25, Pre-obese 25-24.99, Obese ≥ 30 (As per The International Classification)

Smoking- Active smoking of one or more manufactured or hand rolled tobacco cigarettes per day.

Alcohol user- Consumption of alcohol as least 3 drinks per week

Low physical activity- Not having any moderate or vigorous intensity activities 45 minutes in a week.

Unhealthy diet- Consumption of sugar 50 gm or more, salt 5 gm or more and fruits and vegetables less than 400 gm per day and or history of regular intake of junk food.

Statistical Analysis: Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean and the results on categorical measurement are presented in number (%). Chi-square test has been used to find the significance of study parameters and P value.

Results

In this study majority of the patients were in the age group of 40- 50 years which accounted for 49% followed by in the age group of 50-60 years in which 29% of patients of type 2 diabetes mellitus were seen. 74% were males and 26% were females. Mean duration of diabetes mellitus was 8.90±4.35years. 95% patients were on oral hypoglycaemic agents and 22% of patients were on both oral hypoglycaemic agents and insulin. 27% of patients had coexisting hypertension and 38% had pre-hypertension. In the present study 25% of patients had HbA1c of <7% i.e. good glycemic control, 35% had HbA1c between 7-9 i.e. fair glycemic control and 40% had HbA1c >9 i.e. poor glycemic control.

Table 1: Prevalence of modifiable NCD risk factors and it's correlation with glycemic control based on HbA1c biomarker among diabetics

Risk Factors	NCD study population (n=750)	%	Diabetic	%	Good Control (HbA1c <7)	%	Fair Control (HbA1c 7-9)	%	Poor Control (HbA1c >9)	%
Smoking	173	23.07	55	31.79	10	18.18	19	34.55	26	47.27
Use of Smokeless tobacco	138	18.40	39	28.26	8	20.51	12	30.77	19	48.72
Alcohol	132	17.60	35	26.52	7	20.00	11	31.43	17	48.57
Unhealthy Diet	688	91.73	144	20.93	35	24.31	50	34.72	59	40.97
Low Physical Activity	38	5.07	32	84.21	3	9.38	12	37.50	17	53.13
High BMI	381	50.80	94	24.67	19	20.21	34	36.17	41	43.62
Abdominal obesity	411	54.80	96	23.36	19	19.79	35	36.46	42	43.75
Coexisting Pre-hypertension or Hypertension	311	41.47	102	32.80	20	19.61	37	36.27	45	44.12

Table 1. shows that modifiable NCD risk factors were more predominant among the employees having diabetes and poor glycemic control were observed among the diabetics having risk factors such as smoking, alcohol, unhealthy diet, low physical activity, high BMI, abdominal obesity and co-existing hypertension or pre-hypertension which were statistically significant.

Table 2: Comparison of glycemic control of diabetics based on HbA1c biomarker in relation to smoking

	Good Control (HbA1c <7)	%	Fair Control (HbA1c 7-9)	%	Poor Control (HbA1c >9)	%	Total
Smoker	10	18.2	19	34.5	26	47.3	55
Non Smoker	62	61.4	35	34.7	4	4.0	101
Total	72	46.2	54.0	34.6	30.0	19.2	156

Table 2. shows that poor control of diabetes is more predominant among Smokers (47.3%) in comparison of Non Smokers (4%) and it is statistically highly significant (Chi –square (χ^2) value: 115.8, Degree of Freedom (*d.f.*): 2, p-value: <0.001)

Table3: Comparison of glycemic control of diabetics based on HbA1c biomarker in relation to consumption of alcohol

	Good Control (HbA1c <7)	%	Fair Control (HbA1c 7-9)	%	Poor Control (HbA1c >9)	%	Total
Alcohol User	7	20.0	11	31.4	17	48.6	35
Alcohol nonuser	55	45.1	42	34.4	25	20.5	122
Total	62	39.7	53	34.0	42	26.9	156

Table 3. shows that poor control of diabetes is more predominant among Alcohol Users (48.6%) in comparison of Non users (20.5%) and it is statistically highly significant (Chi –square (χ^2) value: 79.2, Degree of Freedom (*d.f.*): 2, p-value: <0.001).

Table 4: Comparison of glycemic control of diabetics based on HbA1c biomarker in relation to abdominal obesity.

	Good Control (HbA1c <7)	%	Fair Control (HbA1c 7-9)	%	Poor Control (HbA1c >9)	%	Total
Abdominal Obesity	19	19.8	35	36.5	42	43.8	96
No abdominal obesity	29	48.3	21	35.0	10	16.7	60
Total	48	30.8	56	35.9	52	33.3	156

Table 4. shows that poor control of diabetes is more predominant among those having Abdominal Obesity (43.8%) in comparison to those having No Abdominal Obesity (16.7%) and it is statistically highly significant (Chi –square (χ^2) value: 82, Degree of Freedom (*d.f.*): 2, p-value: <0.001).

Table 5: Comparison of glycemic control of diabetics based on HbA1c biomarker in relation to coexisting hypertension or pre-hypertension

	Good Control (HbA1c <7)	%	Fair Control (HbA1c 7-9)	%	Poor Control (HbA1c >9)	%	Total
Coexisting hypertension or pre-hypertension	20	19.6	37	36.3	45	44.1	102
No hypertension or pre-hypertension	25	46.3	19	35.2	10	18.5	54
Total	45	28.8	56	35.9	55	35.3	156

Table 5. shows Poor Control of Diabetes is more among those having **Coexisting Hypertension& Pre-hypertension** (44.1%) in comparison to those having Normal BP (18.5%) and it is statistically highly significant (Chi –square (χ^2) value: 79.3, Degree of Freedom (*d.f.*): 2, p-value: <0.001).

Discussions

The study shows that out 750 employees under NCD study, 173 had the history of smoking (23.07%) and among the regular smokers 55 (31.79%) had diabetes and 26 (47.27%) of them had poor glycemic control. 138 employees had the history of regular consumption of smokeless tobacco (18.4%) and among those 39 (28.26%) had diabetes and 19 (48.72%) of them had poor glycemic control. 132 employees had the history of regular consumption of alcohol (17.6%) and among those 35 (26.52%) had diabetes and 17 (48.57%) of them had poor glycemic control. 688 employees had the history of regular consumption of unhealthy diet (91.73%) and among those 144 (20.93%) had diabetes and 59 (40.97%) of them had poor glycemic control. 38 employees had the history of low physical activity (5.07%) and among those 32 (84.21%) had diabetes and 17 (53.13%) of them had poor glycemic control. 38 employees had the history of low physical activity (5.07%) and among those 32 (84.21%) had diabetes and 17

(53.13%) of them had poor glycemic control. 381 employees had high BMI (50.8%) and among those 94 (24.67%) had diabetes and 41 (43.62%) of them had poor glycemic control. 411employees had abdominal obesity (54.8%) and among those 96 (23.36%) had diabetes and 42 (43.75%) of them had poor glycemic control. 311employees had co-existing hypertension and pre-hypertension (41.47%) and among those 102 (32.8%) had diabetes and 45 (44.12%) of them had poor glycemic control. This study shows that poor gylcemic control is predominant among smokers, alcoholics, obese, hypertensive and also those having high BMI, low physical activities and unhealthy diets and the observations are statistically significant.

Conclusions

This study shows that modifiable NCD risk factors were more predominant among the employees having diabetes and poor glycemic control based on HbAIc biomarker estimation which were observed among the diabetics having modifiable risk factors such as smoking, alcohol, unhealthy diet, low physical activity, high BMI, abdominal obesity and co-existing hypertension or pre-hypertension which were statistically significant. Hence HbA1c can be used as a useful biomarker to assess the long-term control of diabetes mellitus and hence to prevent complications

due to diabetes.

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Prevalence, Maternal Outcome, Placental Changes and It's Correlation with Perinatal Outcome in Unbooked Patient's of Iron Deficiency Anemia During Third Trimester

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Abstract

Background: Anaemia is the commonest medical disorder in pregnancy and severe anaemia is associated with poor maternal and perinatal outcome.

Methods: The study was done to analyse the characteristics of hospitalized pregnant women with severe anaemia (Haemoglobin < 7gms %) at the time of delivery and to find out maternal outcome. It was a prospective study done at saraswathi institute of medical sciences,hapur,U.P, India over a period of one year from February 2019 to January 2020.

Results: Results were analysed; out of 3784 deliveries 210 (5.54%) cases were severely anaemic at the time of delivery. Out of 210 women with severe anaemia 184(87.6%) patients belonged to low socioeconomic category, 177 (84.2%) were unbooked cases, 152 (72.4%) cases from rural area and 119 (57.6%) cases were multi gravidas. The maternal complications were Pre-eclampsia and eclampsia (16.1%), intercurrent infections (3%), abruptio placentae (3.3%), heart failure (1.4%), preterm labours (42.8%), intrauterine deaths (10.9%) and postpartum haemorrhage (10.4%).

Conclusions: Severe anaemia during pregnancy is associated with maternal and perinatal morbidity and mortality so effective preventive measures in the form of regular antenatal check-ups and iron supplementation will prevent complications of anaemia in pregnant women.

Keywords: *Anaemia, Haemoglobin, perinatal*

Introduction

Anaemia is the commonest medical disorder in pregnancy and has a varied prevalence, etiology and degree of severity in different populations being more common in non-industrial countries.[1] WHO defines anaemia in pregnancy as a haemoglobin concentration of less than 11 g/dl and a haematocrit of less than 0.33.[2] It uses the following haemoglobin cut offs - 10.0 to10.9 g/dl for mild anaemia, 7.0 to 9.9 g/dl for moderate anaemia and lower than 7.0 g/l for severe anaemia. In India, more than 90% of anaemia cases are estimated to be due to iron deficiency because high iron requirement during pregnancy are not easily fulfilled by dietary intake especially when iron bio-availability is poor.[3] Estimates of the WHO report that from 35% to 75%(56% on average) of pregnant women in developing countries and 18% of women from industrialized countries are anaemic.[4] Principal blood changes during pregnancy. This disproportionate increase in plasma and RBC volumes produces a state of haemodilution (fall in haematocrit) during pregnancy, which is more during

second trimester leading to physiological anaemia. Anaemia is not only responsible for increase in maternal and perinatal morbidity and mortality but also severely affects economic and social status of the country.

Methods

The present was a prospective observational and clinical study, conducted at SIMS, UP in Obstetrics and gynaecology department over a period of one year from February 2019 to January 2020. The pregnant women with severe anaemia in labour were included in the study, after fulfilling the inclusion criteria. A detail history and clinical examination was done as per proforma and required investigation were done. The maternal and perinatal outcome were noted. Inclusion criterias were Hb ≤7 gm/dl, Singleton pregnancy, At the time of delivery. Exclusion criteria: pregnant women with hemoglobin > 7 gm/dl, pregnancy with severe anemia due to acute hemorrhage multiple pregnancy, Women with chronic medical illness, women with blood dyscrasias and hemoglobinopathies. Frequencies and percentages were calculated to assess the distribution of the patient on the socio demographic variables such as age, living setting, religion, dietary habits, booked and unbooked status, parity and living children, degree of anaemia, number of blood transfusions given and mode of the delivery. The outcome of severe anaemia was seen in mother in form of preterm labour, preeclampsia, abruptio placentae, CHF, intercurrent infections and maternal mortality.

Results

Number of deliveries during the study period was 3784. Out of 3784 deliveries 210(5.54%) were severely anaemic. Maximum women belonged to low socioeconomic status (87.14%), living in rural area (72.8%). Anaemia in pregnancy is more common in women of higher parity due to poor iron reserves. Women with low socioeconomic status may not afford or have access to

good maternal health care services because of lack of education or financial constraints. They are therefore more prone to the deleterious effects of poor nutrition, malaria, diarrhoeal diseases and chronic infections. Diminished intake and increased demands of iron, disturbed metabolism, pre-pregnant health status and excess iron demands as in multiple pregnancies, women with rapidly recurring pregnancies, blood loss during labour, heavy menstrual blood flow, inflammation and infectious diseases are important factors which lead to development of anaemia during pregnancy. There has been increased risk of anaemia among pregnant adolescents (teenage pregnancy) due to depleted iron stores that occurred during the adolescent growth spurt. The commonest complication of severe anaemia observed in the present study was preterm labour showing highest incidence of 89 cases (42.8%) followed by preeclampsia (16.1%), intrauterine growth restriction (9.0%), intrauterine death (8.5%), sepsis (3.8%), abruptio placentae in 3.3%, placenta previa (2.3%), cardiac failure in 1.4%. Maternal mortality was seen only in one case (0.47%). Cause of maternal mortality was decompensated cardiac failure due to severe anaemia superimposed with severe preeclampsia. Anemia results in impaired transport of hemoglobin and thus oxygen to uterus, placenta and foetus. It also causes tissue enzyme and cellular dysfunction. This mechanism explains impaired myometrial contractility resulting in atonic uterus, as well as placental dysfunction leading to preterm birth, low birth weight and growth restricted babies and perinatal deaths. The susceptibility of women with severe anaemia to preeclampsia has been linked to deficiency of micronutrients and antioxidants. The reduction in serum levels of calcium, magnesium and zinc during pregnancy has been linked to the development of preeclampsia. Severe anaemia predisposes congestive heart failure as it causes circulatory overload due to increased stroke volume

and tachycardia.

Discussion

In India it is not uncommon to see patients with severe anaemia late in pregnancy with no prior antenatal visits especially in low socioeconomic settings and the same is evident from our study. Worldwide, it is estimated that 58.27 million women are anaemic during pregnancy, of whom 55.75 million (95.7%) live in developing countries. In present study the prevalence of severe anaemia (Haemoglobin < 7 gms%) was 5.54% whereas study by Singhal et al observed the prevalence of 5.7% and Riffat jaleel reported 4.8% of severe anaemia in pregnant women.[5,6] The age group 20-24 years had the highest prevalence of anaemia (68.4%) which agrees with the findings of Rajeshwari and Ashok Kumar, and Rajaratnam et al.[7,8] Anaemia prevalence was also significantly high in pregnant women from low socioeconomic status (87.6%) compared to those from middle socioeconomic status (12.4%). Studies from Allen et al, Rajaratnam et al and Bentley ME also reported the same observations.[9,10] Boniface et al also reported that obstetric risks were more in unbooked pregnant women compared to booked ones.[11] There may be expected decline in haemoglobin level due to haemodilution, increasing fetal demand, underlying maternal infection and untreated anaemia in early pregnancy may also get worse with advancing pregnancy. The booked patient benefits from focused antenatal care objectives, which is proven to reduce maternal and fetal morbidity/mortality, have obvious benefits in terms of risk assessment, active management, correction of modifiable conditions, and boosting the psychological support and family preparedness for a new child.

Conclusions

Anaemia in pregnancy is a major health problem in developing countries. Anaemia contributes significantly to maternal and perinatal morbidity and mortality. By keeping this in view, it is recommended that good antenatal care should be made available, accessible and affordable to all pregnant women through partnership between all tiers of government and non-governmental organizations. New and innovative strategies are needed, particularly those that improve the overall health and nutrition status of adolescent girls before they enter their reproductive years. Early marriages and teenage pregnancies are better avoided. Awareness created regarding dietary habits, small family norms, birth spacing, regular antenatal check-ups and regular intake of iron. Efforts therefore need to be directed not only to correct anaemia but to prevent anaemia, so that we can achieve the millennium development goal of reducing the maternal mortality rate by three quarters.

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Chromogranin A - A New Panorama for Chronic Periodontitis and Psychosocial Stress

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Abstract

Aims: The aim of this study is to determine, compare the Cg-A levels in saliva and plasma in periodontal healthy, in patients with periodontal disease and correlate the same with the stress factor.

Materials and Methods: The study involved thirty subjects. There were categorized into three groups with Group I (10 subjects with healthy periodontal status), Group II (10 subjects with mild to moderate periodontitis) and Group III (10 subjects with severe periodontitis). The clinical parameters such as plaque index, gingival bleeding index, clinical attachment loss and probing depth were recorded. Stress was measured using Holme and Rahe stress rating scale. Blood and Saliva sample were collected and Serum Plasma and Saliva CgA levels evaluated using ELISA. The data obtained from all the three groups were analyzed using SPSS Systat 12 software. The mean variables between the three groups were analysed using Kruskal Wallis test. The correlation between the variables and the stress scores was assessed by Pearson's correlation test.

Results: The results of the study showed significantly higher CgA levels in saliva and plasma of patients with severe periodontitis compared with moderate periodontitis and healthy individuals ($P < 0.05$). There was also a positive correlation between stress scores and Salivary, Serum CgA levels and all clinical parameters.

Conclusion: A significant association between elevated Cg A levels in saliva and plasma with periodontal disease was present in our study. The results suggest that Salivary and Plasma Cg A can be considered as a useful biomarker for evaluating etiopathogenesis of Periodontitis.

Keywords:Chromogranin A, Periodontitis, Psychological stress, Saliva, Plasma

Introduction

Periodontal diseases have an association with a variety of infections and inflammatory lesions.

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Periodontitis is a common disease in humans resulting in clinical attachment loss and also decreased bone support around the teeth causing periodontal pockets because of apical migration of the junctional epithelium. Key factors involved in better understanding of the progression of this disease are the microbial nature of the disease and the host related factors. [1]

The onset and progress of periodontal infections are modified byLocal and Systemic host conditions and the risk factors that alter the resistance of the host to microbial challenge. [2]Systemic risk factors causing increased severity of periodontal diseases are diabetes mellitus, and immune compromised states such as acquired immunodeficiency syndrome (AIDS).It is also noted that severe painful and necrotizing forms are seen in those infected with AIDS. [3]

Stress is one of the major risk factor for periodontal disease. But little research has been done to support this link between psychosocial stress, distress, and coping on periodontal disease initiation and progression.The mechanism of psychological stress in the pathogenesis periodontal disease needs further understanding and exploration. [3]

Seyledefines"stress"as lack of adaptive capacity of organisms to physical and mental forces leading to exhaustion and death". [4]

Stress down regulates cellular immunity by activation of hypothalamo pituitary axis system. HPA (hypothalamus- pituitary-adrenocortical) system and SM (sympathetic adrenomedullary) system which are the two primary neuroendocrine systems associated widely with stress.[4]In the HPA system,regulation of cortisol is by the adrenocorticotropic hormone from the pituitary gland. Salivary cortisol levels are closely correlated to blood cortisol levels and reliably reflect HPA activity. [5]

Cortisol is an established stress biomarker regulated by adrenocorticotropic hormone from the pituitary gland. Salivary cortisol levels are correlated to serum and are found to activate the HPA. The cortisol levels can be considered as an indicator of psychologic stress. [6]

It has been shown that immune activities are influenced by emotional orpsychological stress through neuroendocrine messengersubstances. [5]

The presence of neuropeptides has been considered as neurogenic promoter invarious inflammatory processes modulating theactivity of the immune system along with releasereleaseofcytokines. [7]

Chromogranin A (CgA) is a stress related hormone. [6] Recently it has been proposed that the chromogranins may be precursors of multifunctional hormones. It is noted that CgAis more stable than catecholamines in the circulatory system. [8]

Chromogranin A (CgA), a 49 kDa protein belongs to the granin family. It is produced by the endocrine and neuroendocrine cells. CgA and calcitonin are present and stored in the chromaffin granules of the adrenal medulla. [7]

CgA is a precursor for many peptides especially biologically active peptides. These biologically active peptides have an important role in regulating the endocrine, metabolic and immune system. Chromograninsindicatessignificantsympathoadrenal activity and are potentialmarkers of secretion pertaining to normal and neoplastic neuroendocrine cells.[7]

Periodontal disease is caused by the activation of HPA Axis. This further influences the T-helper cells (Th) phenotype by inhibition of interleukin IL-12 and stimulation of IL-10 secretion by macrophages. [8]

This study was done to determine and compare the Cg-A salivary and plasma in patients with or without chronic periodontitis and correlate the same with the stress factor.

Material and Methodology

The study was undertaken in the Department of Periodontology and Department of Biochemistry, Annamalai University, Chidambaram.

The sample size was determined using the formula

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{g} n_i \left(\bar{r}_{i\cdot} - \frac{N+1}{2} \right)^2$$

$$= \frac{12}{N(N+1)} \sum_{i=1}^{g} n_i \bar{r}_{i\cdot}^2 - 3(N+1)$$

A total of 30 subjects (age group of 25-55 years) participated in the study. The participants were included in the study after obtaining written consent and they were informed all the details pertaining to the study.

Each group had 10 subjects. The study was approved for ethical issues by the Human Ethics Committee, RMMC on 5th July 2016. (IHEC/0154/2016)

Group I   Periodontally healthy subjects

Group II   Mild to Moderate Chronic Periodontitis

Group III   Severe Chronic Periodontitis

ARMAMENTARIUM

Armamentarium used included Mouth mirror, Explorer, Williams Periodontal Probe, Disclosing solution, Dappen dish, Tweezers, Cotton, Surgical spirit, Mouth mask, Gloves, Disposable plastic syringes with needle, Sample collection tubes, Chromogranin A ELISA kit® (Genxbio Greater Noida).

Inclusion Criteria

Inclusion criteria included included the following groups.Group I –Periodontally healthy subjects with less than 3 mm probing depth and no significant attachment loss. Group II - Moderate periodontitis with a probing depth of 4-6mm and clinical attachment loss of 3-4mm. Group III- Severe periodontitis with a probing depth of greater than 6mm and clinical attachment loss more than 5mm.[9]Stress rating scale (Holmes and Rahe-1967) - >150+ [13]

Exclusion Criteria

Exclusion criteria included patients history of smoking, Systemic complications, Known pregnancy, History of any periodontal therapy in the last 6 months, History of systemic medications in the last 6 months, Patients with aggressive Periodontitis

Clinical examination

All patients were briefly informed about the procedure and informed consent was taken.Clinical examination was carried out using mouth mirror, a dental explorer and William's periodontal probe. The following clinical parameters included in the study were assessment of plaque by Plaque index [10]. The assessment of gingival bleeding by Gingival Bleeding Index [11] and probing depth (PPD), Clinical attachment loss were also assessed. [12]

ASSESSMENT OF PSYCHOSOCIAL STRESS VALUES

In our study Psychosocial stress levels were assessed based on Holmes and Rahe stress scale [13]. This stress scale has a series of questionnaires termed as "Life Change Units" which applies to the events in the past year of a person's life.

All the individual units were added and the final score estimatesthe influence of stress on health.

Interpretation of the scores

1. 300+: Indicates risk of illness

2. 150-299: Indicates that the risk of illness is moderate

3. <150: Indicates slight risk of illness.

Saliva sampling

Saliva samples were collected from subjects in the morning following an overnight fast. Navazesh[14] method of saliva sampling was used; the expectorated

saliva samples were obtained in the polypropylene tubes. The centrifuging was done at 3000 rpm for 15 min and the resultant was frozen at- 40°C andstored until required for further biochemical analysis.

Plasma sampling

Ethylene diamene tetra acetic acid EDTA (1 mg/ml) coated test-tubewas used to collect 5 ml of venous blood samples by standard venipuncture method. EDTA was added and mixed for 10-20 minutes. The obtained plasma was separated from blood by centrifugation at 2000- 3000 rpm for 10 min. They were stored at -40°Cuntil required for biochemical analysis.

Biochemical assay procedure

ELISA technique was used to measure the CgAaasay in saliva and plasma. [ELISA Kit - (Sensitivity range of the kit (01 ng/l)]. The kit was procured from Genxbio, Greater Noida..

[The Assay characteristics: Limit of detection: 15.01ng/ml, intraassay precision: CV% <10%, Correlation Value CV%: SD/MEANX100, interassay precision: CV% < 12%. Reference interval based on normal distribution (95% double sided) and established by lab was: 30ng/L to 9000 ng/ml.]

Results

The data obtained from all the three groups were analyzed using SPSS Systat 12 software.

The mean variables between the three groups were analysed using Kruskal Wallis test. The correlation between the variables and the stress scores was assessed by Pearson's correlation test.

Table 1shows the comparison of mean clinical parameter values between the three groups. The mean values are as follows

1. Plaque index (.43, .74, 1.02),

2. Gingival bleeding index (4.43, 70.01, 76.81),

3. Probing depth (2.64, 4.85, 6.68),

4. Clinical attachment level (.00, 4.48, 7.31)

A significant higher values were seen in severe (Group III) than Moderate (Group II) and Healthy groups (Group I).

The mean stress scores for the three groups are

1. Group I 149.40,

2. Group II 308.80,

3. Group III 454.20.

A significant higher values were seen in severe (Group III) than Moderate (Group II) and Healthy groups (Group I).

The mean values of biomarker CgA levels in plasma were statistically significant. The mean values for the healthy, moderate and severe are 361, 581, and 924 respectively.

The mean values of biomarker CgA levels in saliva were statistically significant. The mean values for the healthy, moderate and severe are 1016.70, 1229, and 1739 respectively.

The Pearson correlation coefficient was applied to find the relationship between, the i) clinical parameters and CgA ii) CgA plasma and saliva with Stress.

The relationship between the clinical parameters and Cg A was found to have a high correlation in the Severe and Moderate chronic Periodontitis group in comparison to healthy group. It was also noted that there was a positive correlation between CgA and Stress.

Table 1: Comparison of mean clinical parameter values and Cg A level in Plasma and saliva between the groups

GROUP	AGE	PI	GBI	PPD	CAL	CHROMOGRANIN A IN PLASMA (ng/ml)	CHROMOGRANIN A IN SALIVA (ng/ml)	STRESS SCORE	P value
I (Healthy)	27.40	.43	4.43	2.64	.00	361.00	1016.70	149.40	
II (Moderate)	34.90	.74	70.01	4.85	4.48	581.00	1229.00	308.80	P < 0.001
III (Severe)	40.50	1.02	76.81	6.68	7.31	924.00	1739.00	454.20	

Table 2: Pearson correlation between the i) clinical parameters and CgA ii) CgA plasma and saliva with Stress

Groups	PD with CG A plasma	PD with CG A saliva	CAL with CG A plasma	CAL with CG A saliva	CG A plasma with Stress	CG A saliva with Stress
Healthy	.432	.442	.412	.404	.808	.851
Moderate	.507	.675	.543	.699	.987	.861
Severe	.667	.572	.687	.677	.732	.672

Figure 1: Clinical examination - Periodontally healthy and Chronic Peridontitis

Figure 2: Chromogranin A elisa kit
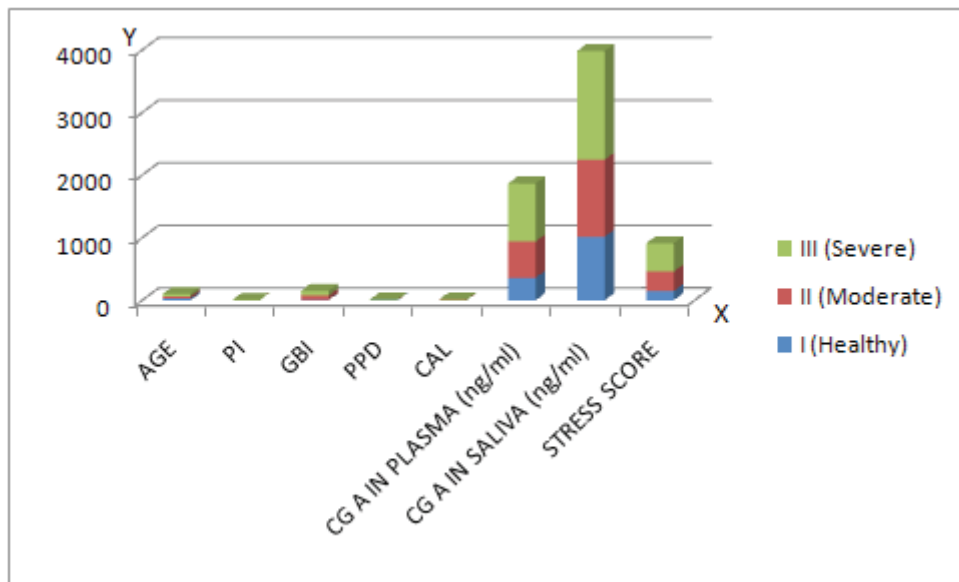
Figure 3: Graph 1 Comparison of mean values of periodontal clinical parameters and Cg A levels between the groups
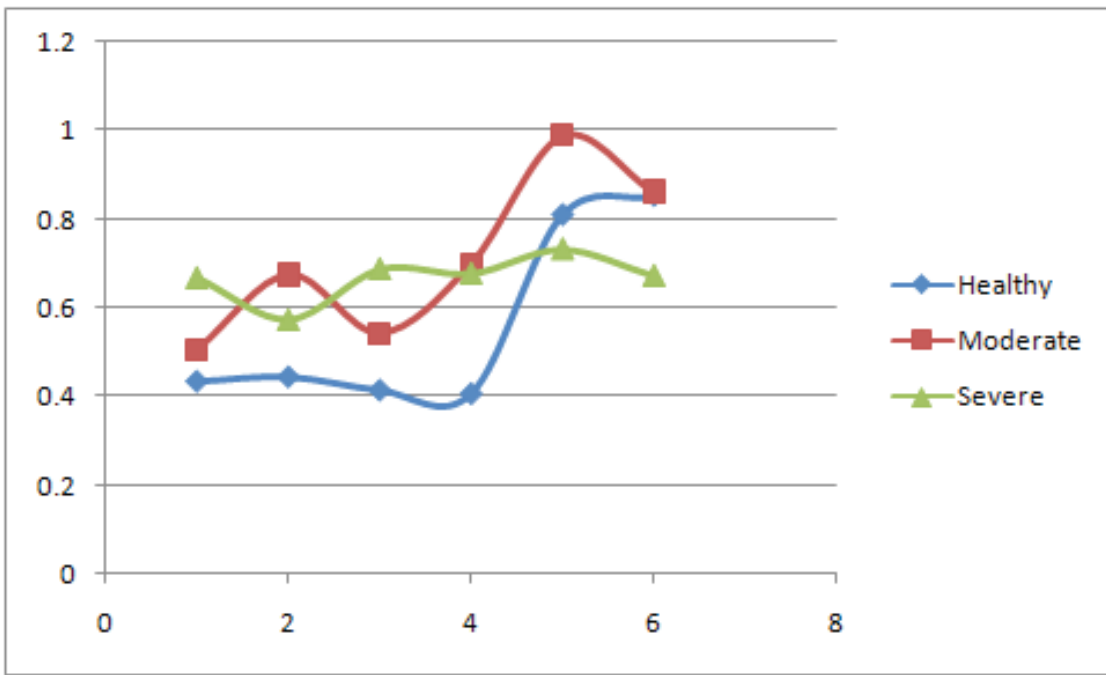
Figure 4: Graph 2 Pearson's correlation

Discussion

Periodontitis is caused due to various factors and stress is considered to be a potential marker in the evaluation of the etiopathogenesis of periodontitis. The link between periodontitis and stress related hormones was not considered at large and has been overlooked. Limited studies are available correlating stress with periodontal disease. Necrotizing forms of periodontal disease has been reported in most cases of stress associated periodontitis. [14]

Stress related peptides like CgA and α Amylase were demonstrated in saliva and are found have some relation to periodontal disease in some studies. These peptides are released due to excessive stress load and are known to play a role in the pathogenesis of periodontitis. Shanon et al discussed that emotional factors alters the oral environmental condition which may indirectly influence the health of the periodontium.[15] Mostly changes in the composition or flow of saliva were noted. Salivary components are affected by psychological stresses that are associated with autonomic nervous system activity. Periodontal disease is caused by the activation of HPA Axis. This further influences the T-helper cells (Th) phenotype by inhibition of interleukin IL-12 and stimulation of IL-10 secretion by macrophages. [14, 15, 16]

Animal studies carried out by Gaspersic et al showcased that the experimental animals had less attachment and more alveolar bone loss when exposed to stress. This demonstrated the possible detrimental role of stress in periodontal tissue. [17, 18]

The present study was done to determine and compare the Cg-A salivary and plasma in periodontally healthy patientsandperiodontally diseased patients and correlate the same with the stress factor.

A total of 30 subjects (age group of 25-55 years) participated in the study consisting which had 10 subjects comprising each group.

Group I   Periodontally healthy subjects

Group II   Mild   to   Moderate   Chronic

Periodontitis

Group III   Severe Chronic Periodontitis

In our study, the salivary and plasma CgA levels were compared between the three groups and also correlated with stress scores. The method of grouping the sample in this study was similar to the study done by Reshma et al (2013). [19]

In our study, the mean plaque score were found to be significantly higher for those with Severe Chronic periodontitis than Mild to Moderate Chronic periodontitis and Healthy patients. These findings had similarity to the study done by Hugoson et al. [20]

There is increased plaque accumulation as the periodontal pocket deepens and vice versa.In the present study, the mean GBI score were found to be significantly higher for those with Severe Chronic periodontitis than Mild to Moderate Chronic periodontitis and Healthy patients. Deinzer et al (1998) reported similar findings in his study and also considered psychological stress to be a risk factor for periodontal inflammation. [21]

In our study, the mean attachment loss and Pocket Probing Depth scores were found to be significantly higher for those with severe chronic periodontitis than Mild to Moderate Chronic periodontitis and Healthy patients. This is in accordance with Hayashi et al (2001). [22]

We found significant difference in the Salivary and Plasma CgA levels between Severe Chronic periodontits, Mild to Moderate Chronic periodontitis and Healthy patients. The Salivary and Plasma CgA levels of Severe Chronic Periodontitis (1739 ng/l, 924 ng/l) were higher compared to Mild to Moderate Chronic Periodontitis (1229 ng/l, 581 ng/l) and Healthy patients (1016.7 ng/l, 381 ng/l) exhibited less CgA levels. Our findings correspond with the study done by HadyHaririan et al, 2012. [23]

The increased salivary secretion of these peptides in Severe Chronic Periodontitis and Mild to Moderate Chronic Periodontitis patients could be due to the alteration of neuroendocrine immune functions and the nervous system reactioncausing immune activation. This alteration is a resultant of higher systemic stress loading.[24]

There is lack of clarity in the pathophysiologic functions of CgA in the oral cavity. CgA is found to be related to oral bacterial infection in addition to being a stress-related biomarker reflecting the SNS.[26] Bovine polymorphonuclearneutrophils releases Vasostatin-1, the N-terminal fragment of CgA during stress. [24]

Polymorphonuclearneutrophilsprovideinnate immunity against bacterial infections in periodontal disease, and it is a known fact that CgA fragments are found to be produced in a local environment by human Polymorphonuclear neutrophils in periodontitis.[24,25]

The results of our study show that CgA may play a role in the communication between the neuroendocrine and immune systems. [25]

Salivary changes affect the oral health status. Several locally and systematically derived markers of periodontal disease are found in saliva and it is easy to collect them from saliva. [26, 30]

Stress alters the psychological state of a patient impacting the production of proteins resulting in pathological condition. The association between CgA expression in saliva, stress factors and dry mouth syndrome has been reported. [27, 29]

CgAis a stable molecule in blood samples andthevulnerabilitywhile handling the samples is less making it a reliable marker. [28]

In our study the stress scores exhibited by Severe Chronic Periodontitis (454.2) were more compared to Mild to Moderate Chronic Periodontitis (308.8) and Healthy subjects (149.4). This highlights the positive

correlation between stress scores and Serum CgA levels and all the clinical parameters. [19]

Limitations

In this study we have evaluated one face of the coin "stress", the other face "coping" if measured would result in better understanding of the relation between stress and periodontitis.

Studies with larger sample size will be required to establish Chromogranin A as a plausible biomarker in periodontal disease.

Conclusion

The findings and results of our study indicate that Cg A is a reliable marker for correlating stress with periodontal disease. The elevated Cg A levels in saliva and plasma highlights the association with periodontal disease. Our results suggest that Salivary and Plasma Cg A can be considered as a useful biomarker for evaluating etiopathogenesis of Periodontitis.

Ethical Clearance- Taken from **Human Ethics Committee, RMMC (IHEC/0154/2016)**

Source of Funding- Self

Conflict of Interest - Nil

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Knowledge on COVID-19 among Nursing Students of a Selected Nursing Institute of Dhaka City, Bangladesh

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Abstract

Background: Bangladesh is trying to shape out coronavirus disease of 2019 (COVID-19) pandemic with limited frontiers resources science March 2020. Among all frontier, Bangladeshi nurses are also playing a dynamic role to control infection through direct contact with COVID patients.

Objective: This research aims to identify the level and predictors of poor knowledge of nursing students toward the COVID-19.

Method: This study was a quantitative type of cross-sectional study with 150 participants randomly selected from 226 students of the Armed Forces Medical Institute located in Dhaka Cantonment of Dhaka city of Bangladesh. Data were collected by using a pre-tested questionnaire through a telephonic interview by trained and experienced interviewers. Analysis was done by using univariate, multivariate techniques followed by regression modeling.

Result: Overall level of knowledge was observed poor (67.3%) among more than half of BSc nursing students. A greater part of nursing students got poor knowledge on the preventive measures to reduce transmission of COVID 19 (98.7%; 40.20±12.39) & management of COVID 19 (94.7%; 40.20±12.39). In terms of predicting the causes of poor knowledge, this study found that BSc nursing students of the second year (AOR= 2.53, p < 0.01) are more likely to have poor knowledge on COVID-19 compared to another educational group.

Conclusion: Nurses are the frontiers to mitigate COVID-19 and manage the affected people effectively. Therefore, knowledge of them needs to be perfect to ensure the proper practice to prevent COVID-19. Thus, an enthusiastic and demonstrative learning system is required to make them knowledgeable enough against COVID-19.

Keywords: *Knowledge, COVID-19, nursing students.*

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Background

Bangladesh has been battling against the coronavirus disease of 2019 (COVID-19) that remains also ongoing all over the world and

healthcare professionals who are on the front line of health services are extremely endangered by this infection. The first confirmed case of COVID-19 in Bangladesh was identified on March 8, 2020, and the number of cases has been on the rise. To date, the confirmed cases are more than 723,221 in Bangladesh and 142.1 million globally[1]. COVID-19 is defined as an infectious disease caused by a newly discovered coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). COVID-19 is an emerging respiratory infection that is familiar to cause illness ranging from the common cold to severe acute respiratory syndrome (SARS), which was first reported in December 2019, in Wuhan city, Hubei Province, China[2,3].

Coronavirus is an enveloped RNA virus transmitted by human-to-human through the inhalation of droplets. The viral antigens are diagnosed in the respiratory secretions and antibodies in the serum by using the enzyme-linked immunosorbent assay (ELISA) test[4]. Fever, dry cough, fatigue, myalgia, shortness of breath, and dyspnea are the main identified clinical symptoms of COVID-19[5]. Guidelines and protocols of COVId-19 that were published by the World Health Organization (WHO) were followed in the maximum countries of the world[6]. Information on signs, symptoms, prevention and protection measures against COVID-19 are included in these protocols. Everyone should protect themselves and others to prevent the spread of the disease by following proper hand hygiene, proper distancing, use of mask, proper etiquette when coughing and sneezing, and isolation and decontamination of surfaces that are summarized by The Centers for Disease Control and Prevention[7].

WHO highlights the warring of "another dangerous virus" called an "infodemic", which is a life-threatening pandemic reasoned for millions of deaths and rapidly widened all over the world day by day. The wrong information and rumours in the context of the misinformation, which boosts confusion against slowing the spread of disease, is referred to by this term. On "misinformation costs lives", reducing misconceptions and confusion about the virus and dealing effectively with the extensive amount of correct and fake coronavirus information is a matter of prerequisite, WHO states concerning this phenomenon[8]. Especially elderly and patients with chronic medical conditions such as diabetes and cardiovascular diseases are more possible to get a severe infection[9].

According to the KAB (Knowledge–Attitudes–Behavior) model of health literacy, knowledge and attitude have a pivotal role in behavioural changes[10]. Gaining knowledge, formation of beliefs and development of behaviour are the three uninterrupted procedures of behaviour changes[11,12]. The theory of KAB highlights a practical account of how attitude can be affected directly and behaviour can be affected through attitude indirectly by a person's knowledge[11]. As healthcare workers, nursing students have the potentiality to care for infected patients from direct contact and have a significant role to control infection[13]. Thus, measures of KAB can play a key role as a factor to tackle the outbreak of COVID-19 for healthcare professionals especially nurses who are working round the clock by putting themselves in danger.

Data from a study of Iranian hospitals indicated that the percentages of up to date knowledge of COVID-19 outbreak among the nurses had more than half (56.6%) of the nurses[14]. In China, healthcare workers about their attitude towards COVID -19 outbreak showed that anxiety is one of the vital matters for healthcare professionals including nurses who have the anxiety to think about protection for themselves and their families from the virus infection[15]. In India, a cross-sectional study through the nursing students on knowledge, attitude, and practices demonstrated

that 68.67% of nursing students possessed excellent knowledge apropos of COVID-19, which would be a large reservoir for healthcare response in the future[16]. Another study conducted within the nursing students in Nigeria showed that 73.7% had good knowledge, 66% of them had a positive attitude regarding COVID-19, and 62.8% expressed their willingness to serve as volunteers in the care of infected patients[17].

A study carried out in Bangladesh hospitals showed that nearly two-thirds percent of nurses (73.42%) held good knowledge and 73.42% of nurses had good practices towards prevention and control of COVID-19 infection[18,19]. As future healthcare providers, nursing students need to make themselves mentally strong by offering quality training and teaching that will affect the outcomes and will help them to take upcoming courageous steps. Therefore, this research aims to appraise the present knowledge of nursing students toward the COVID-19.

Methods

Study design and participants

The study design was cross-sectional status and conducted in the Armed Forces Medical Institute located in Dhaka Cantonment of Dhaka city of Bangladesh. This institute was selected by reason of the hospital related to this institute was dedicated to COVID-19 patient management. The participants were the students studying in BSc (Bachelor of Science) in nursing who met the inclusion criteria: (1) BSc students who were studying in the selected institute, and (2) willingness to participate in the study. The sample size was calculated based on scientific method using the procedure [19].

$$n = \frac{Z^2 \times pq}{d^2}$$

Where, n = required sample, z = the statistic corresponding to level of confidence = 1.96, p = the expected prevalence of COVID-19 knowledge among nursing students=75%[20], q = 1-p, and d = precision corresponding to effect size = 0.05. The required sample size was 288 participants, whereas finally, 150 participants were reached due to inconvenience of the students through phone calls.

Survey procedure

Data were collected through telephone interviews by trained and experienced data collectors. The survey was conducted using a semi-structured questionnaire. Pre-tested, necessary modification and corrections were performed before conducting the survey. The samples were selected using systematic random sampling through the student list employing the probability-proportional-to-size (PPS) technique. A list with 226 number of students was collected from the authority of the institute. The targeted samples were accessed randomly from the list.

Socio-demographic variables and knowledge of different components of COVID-19 were collected from the potential respondents. The survey questions were adapted and modified from previously published literature regarding the related topic[20,21,22], infection prevention measures for COVID-19 by World Health Organization[23], and guidelines suggested by the country's Institute of Epidemiology, Disease Control and Research (IEDCR)[24]. The questionnaire comprised of several sections: socio-demographic information: age, religion, educational status, family type, parental occupation, and household income; knowledge on different components of COVID-19 included definition of COVID-19, symptoms, incubation period, transmission route, preventive measures, using face mask, donning and doffing of personal protective equipment, techniques of hand washing, quarantine and isolation.Verbal consent was taken from each participant prior to enrolment, while the study objectives were described to participants, and anonymity and confidentiality were confirmed. Trained research staff performed data management

under appropriate supervision.

Outcome measures

A scoring system was developed to categorize the participant's knowledge level of COVID-19. All the components related to knowledge were included in the score calculation. Only the correct answers to each knowledge question were listed. Each correct response was assigned a score of 1, each incorrect response was assigned a score of 0.For multiple answers; the score of 1 was divided by total numbers of answers. Afterwards, total score was converted into percentage and classified into two categories. Poor knowledge corresponded to a score of (<50%) and moderate/ good knowledge corresponded to a score of (>50%)[25].

Data Analysis

Unadjusted and adjusted logistic regression models were used to identify predictors affecting to the participant's knowledge related to COVID-19. All independent variables were tested individually by Chi-square (X^2) and entered into the first model since they were associated with adherence <0.05 level of significance. The model was tested for sensitivity by the forward selection procedure (e.g., including and excluding specific variables) with the robust standard error. The predictor variables were included in the adjusted model only if any label of the predictor was significant at ≤ 5% risk level in the unadjusted logistic regression model which was used to adjust for the effects of other potential confounders.The statistically significant level was considered a probability value (p-value)of ≤ 0.05. All data analyses were performed using statistical software SPSS(Statistical Package for Social Sciences) 20 version.

Ethical Clearance: The study complied with the Declaration of Helsinki and was approved by the Ethical Review Committee, Department of Public Health, Northern University Bangladesh, Dhaka, Bangladesh (Memo no. NUB/DPH/EC/2020/10a). Participation of the respondents was anonymous and voluntary. Informed consent was sought from the respondents at the beginning point of survey and participants could withdraw from the survey at any time.

Results

This study was conducted among nursing students studying in aselected nursing institute of a dedicated hospital for COVID-19 patient managementin Dhaka, Bangladesh to identify the level of knowledge of COVID-19.

Participant's characteristics:

A total 150 BSc (Bachelor of Science) nursing students was enrolled in this present study.

Study shows that more than half of study respondents were of age group 21-23 (62%) with significantly (p < 0.01) highest poor knowledge (36.7%) on COVID-19. Greater part of respondent's mother was housewife& father were service holder as occupation (92% & 37.3% respectively) with poor knowledge (60% & 26% respectively) related to COVID-19. Beside to thisfrom all income group highestrespondents were from lowest income group <20,000 BDT and belongs to nuclear family (39.3% &72.7% respectively) who reported poor knowledge (26.7%) on COVID-19. In terms of education majority of respondents were fourth year nursing students (31.3%) but poor knowledge (20.7%) on COVID-19 was observed among second year nursing student.

Table 1: Level of Knowledge on different components of COVID-19 among the respondents (n=150)

Knowledge on different components of COVID-19		n	%	Mean±SD
Definition	Good	150	100	100.00 ± 000
	Poor	0	0	
Symptoms	Good	13	8.7	48.30±14.63
	Poor	137	91.3	
Incubation period	Good	126	84.0	84.00±36.78
	Poor	24	16.0	
Transmission route	Good	14	9.3	50.13±16.98
	Poor	136	90.7	
Preventive measure	Good	2	1.3	40.20±12.39
	Poor	148	98.7	
Management	Good	8	5.3	42.00±14.42
	Poor	142	94.7	
Using face mask	Good	117	78.0	80.33±20.39
	Poor	33	22.0	
PPE donning	Good	115	76.7	83.47±19.62
	Poor	35	23.3	
PPE doffing	Good	22	14.7	57.33±16.88
	Poor	128	85.3	
Hand washing technique	Good	149	99.3	98.17±7.15
	Poor	1	0.7	
Quarantine	Good	56	37.3	62.50±21.43
	Poor	94	62.7	
Isolation	Good	20	13.3	55.44±17.85
	Poor	130	86.7	
Total knowledge	Good	49	32.7	66.82± 7.92
	Poor	101	67.3	
Data are presented as frequency (n), percentage and mean, Standard Deviation				

In table 1, multiple responses on knowledge component regarding COVID 19 was observed. Surprisingly this study found; greater part of nursing students got poor knowledge on symptoms and preventive measure to reduce transmission of COVID 19 (91.3%; 48.30±14.63 & 98.7%; 40.20±12.39 respectively). Likewise, poor level of knowledge was reported by highest study respondents about route of transmission (90.7%), management of COVID 19 (94.7%), PPE doffing (85.3%), isolation (86.7%) & quarantine (62.7%). On the other hand,100%BSc nursing students had good knowledge regarding definition of COVID 19. Good level of knowledge wasalso observed on hand washing technique (99.3%) with a mean knowledge score of 98.17±7.15. Furthermore, majority of respondents had good knowledge on other components like incubation period of COVID 19 (84%), using face mask to prevent transmission (78%), PPE donning (76.7%).
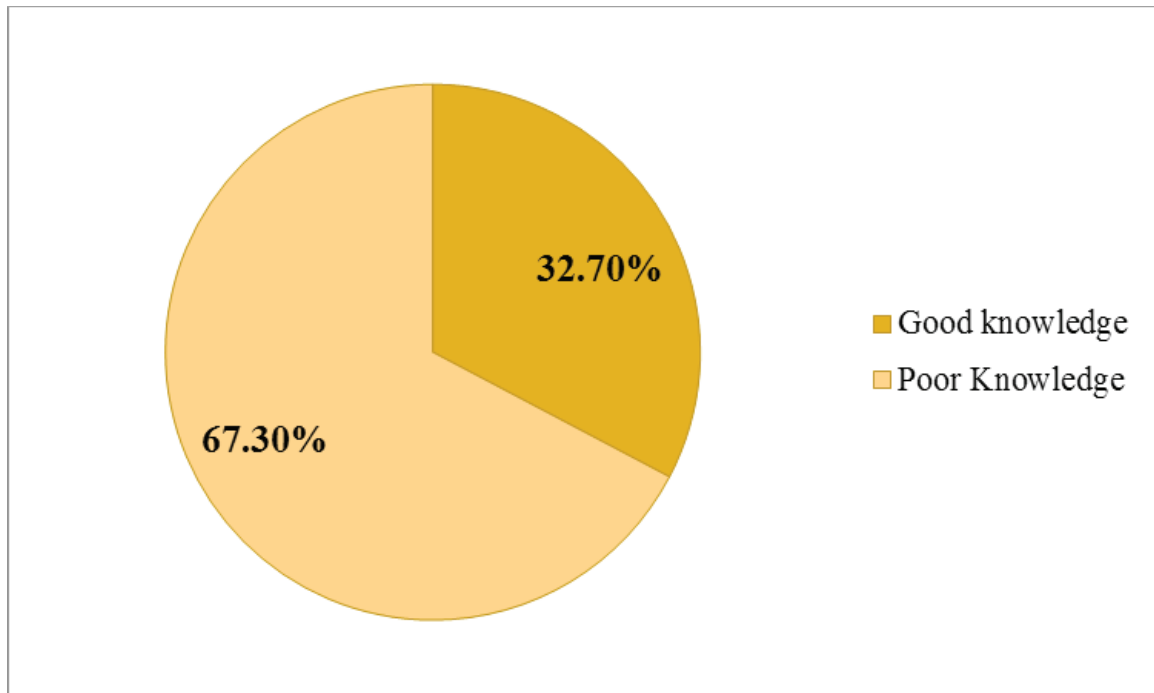
Figure 1: Distribution of respondents according to the total level of knowledge (n=150)

In figure 1; total level of knowledge was observed poor(67.3%) among more than half of BSc nursing students, very few had overall good knowledge (32.70%) on COVID 19.

Table 2: Predictors influencing knowledge on COVID-19 (n=150)				
Demographic characteristics	**Un-adjusted OR (95% CI)**	**p**	**Adjusted OR (95% CI)**	**p**
1. Age (years)				
18-20	2.88 (1.38-6.28)	0.01*	-	-
21-23	Reference			
2. Religion				

Cont... **Table 2: Predictors influencing knowledge on COVID-19 (n=150)**

Muslim	0.65 (0.19-2.18)	0,49	-	-
Non-Muslim	Reference			
3. Education				
First Year	0.32 (0.11-0.93)	0.03*	1.95 (0.56-6.74)	0,28
Second Year	0.30 (0.11-0.83)	0.02*	2.53 (0.87-7.32)	0.08*
Third Year	1.20 (0.49-2.91)	0,68	0.75 (0.30-1.86)	0,54
Fourth Year	Reference			
4. Monthly Family Income (BDT)				
>20000	0.89 (0.40-1.99)	0,78	-	-
20000-30000	0.84 (0.35-2.03)	0,7	-	-
>30000	Reference			
5. Occupation of Father				
Service	1.16 (0.44-3.02)	0,75	-	-
Business	1.64 (0.61-4.40)	0,32	-	-
Farmer	1.55 (0.46-5.19)	0,47	-	-
Unemployed	Reference			
6. Occupation of Mother				
House wife	1.37 (0.41-4.56)	0,6	-	-
Service/Retired person	Reference			
7. Family type				
Nuclear	0.91 (0.42-1.95)	0,81	-	-
Combined	Reference			
Data are generated by Logistic Regression analysis. * Statistical significance at p value ≤0.05.				

In terms of predicting the causes of poor knowledge on COVID 19 initial binary regression analysis found that age group 18-20 (COR= 2.88; 95% CI: 1.38-6.28;p < 0.01) & student of first year (COR= 0.32; 95% CI: 0.11-0.93;p < 0.01) BSc nursing was significantly influencing the poor knowledge on COVID 19. Once modelling was done along with backward elimination process this study found that BSc nursing students of second year (AOR= 2.53, p < 0.01) are more likely to have poor knowledge on COVID-19 compared to another educational group.

Discussion

Rapid transmission of the current pandemic

COVID-19 is not only smashing the Bangladesh but also the whole world. For the implementation of the health care safety nurses plays a role as frontiers thus they must need to avail perfect knowledge as well as practice on preventive aspects. This study conducted to assess the real knowledge level of the nursing students as it influences their practice as frontiers to mitigate COVID-19.

This study found; more than half of BSc nursing students had poor level of overall knowledge (67.3%) on COVID 19 infection. Greater part of nursing students got poor knowledge on symptoms, route of transmission, management, PPE doffing, isolation, quarantine and preventive measure to reduce transmission of COVID 19. However, all theBSc nursing students had good knowledge on definition of COVID 19 and hand washing technique. Furthermore, majority of respondents had good knowledge on other components like incubation period of COVID 19 (84%), using face mask to prevent transmission (78%), PPE donning (76.7%). Likewise, a cross-sectional study found more Indian nursing students had good knowledge on COVID-19 rather than the Australians[29]. The Spanish study observed that students' knowledge about COVID-19 community prevention measures was adequate, but not about preventive measures when treating patients with COVID-19 only due to their less confidence[30]. Therefore, knowledge among the nursing students needs to be adequate to improve their confidence. Another study showed that the knowledge level of COVID-19 plays an important role in enhancing the professional identity of the nurses[31].

To explore the predictors of poor knowledge background information reflected that significantly (p < 0.01) highest poor knowledge (36.7%) on COVID-19 observed among the age group (21-23) years. Second year nursing students were found to have poor knowledge (20.7%) as they got online classes for the first time in life which indicates they could not grasp actual knowledge as effectively. Furthermore, from all income group highest respondents were from lowest income group <20,000 BDT and belongs to nuclear family (39.3% & 72.7% respectively) who reported poor knowledge (26.7%) on COVID-19. From a cross-sectional study in India it is observed that 54.67% of nursing students were in the age group of 20 - 25 years and majority 62% were females. 56.67% of nursing students were studying in Basic B. Sc. Nursing course. About 68.67% of nursing students have excellent knowledge regarding COVID 19 whereas, 81.33% of nursing students had previous knowledge regarding COVID-19. However, the study did not find any significant association between the findings and demographic variables of the study subjects[16]. It might be due to conveniently less sample size selected to conduct the study and different demographic conditions. An editorial article reported that due to suspension of nursing campus courses a learning gap can be developed between hand hygiene theory and clinical training for nursing students therefore, the writing proposed a virtual classroom education approach which may help address the learning gap by providing ongoing theoretical strengthening of hand hygiene during clinical nursing training[26]. Another cross-sectional study conducted on to evaluate the knowledge, attitude and practices towards SARS-CoV-2 among the nursing students of University of Palermo during the rapid rise period of the COVID19 pandemic[27]. The study showed good knowledge and practice (p=0.025) on COVID-19 among the respondents. Study also showed a significant association between demographic components and 'Practice poor score' which coincides the outcome of the study.

The findings of this study indicate that the new normal situation derived by the COVID-19 pandemic hampers the proper and effective study of the nursing students which leads the por knowledge

level regarding COVID-19 infection. As nurses are the frontiers, they should have clear basics to prevent the novel infection and serve the community. A study in Indonesia confirms that the role of nurses much needed in overcoming the occurrence of a Covid-19 pandemic transmission through educating the public about the transmission of coronavirus in maintaining health for the suburban community[28].

Conclusion

The aim of this study was to assess the Knowledge of nursing students on prevention of COVID 19. Finding of the study suggest that, nursing students demonstrated good knowledge on specific components of COVID 19 as PPE, and hand washing technique which was their common and previous knowledge. However, poor knowledge found on the major components of COVID-19 prevention which is due to the lack of study opportunity after lockdown. Therefore, effective and reliable opportunities to gain adequate knowledge COVID-19 needs to be ensured which will be a large reservoir for health care response when the need arises. This study recommends the planned demonstrative opportunitiesalong with virtual classroomapproach to countries the poor knowledge due to suspension/ ineffective online classes will be a supportive way to enhance the knowledge of the nursing students regarding COVID-19 prevention strategies.

Conflict of Interest: No author had any conflict of interest to declare.

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Umbilical Cord Coiling Index at Term Gestation and Its Association with Perinatal Outcomes

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Abstract

Background: Umbilical coiling index (UCI) is the number of coils in the cord divided by the cord length in centimeters. .On the basis of UCI umbilical cords have been grouped as: hypocoiled (UCI Less than 10th percentile) normocoiled (UCI between 10th–90th percentile) and hypercoiled (UCI More than 90th percentile).Various reports have shown that abnormal coiling index is associated with adverse perinatal outcomes. There is a wide variations among the various studies done so far. Some studies have reported significant association between abnormal UCI and adverse perinatal outcomes whereas few studies did not show significant association. **Material & Methods:** This prospective study was conducted on 200 randomly selected Indian pregnant women with singleton pregnancy at POG ≥37 weeks.The UCI less than 10th percentile and more than 90th percentile were considered as hypocoiled and hypercoiled respectively then association between abnormal UCI and intrapartum events (fetal heart rate (FHR) abnormality, meconium stained liquor, mode of delivery)and neonatal outcome (birth weight, IUGR,Apgar score and need for NICU admission) were evaluated. **Results & Conclusion** The mean UCI was 0.21 ± 0.08 coils /cms. 9.50% coils were hypocoiled, 81% were, normocoiled and 9.50% were hypercoiled . No statistically significant association was found between abnormal coiling and perinatal outcomes.

Keywords: *Umbilical cord coiling index (UCI) Hypercoiling umbilical cord, Hypocoiling umbilical cord, Fetal distress, Perinatal outcome, IUGR*

Introduction

The umbilical cord is vital to the development, well-being and survival of the fetus. The most distinctive feature of the umbilical cord is the helical pattern of its vessels. A coil is defined as complete 360 degree spiral courses of umbilical vessels around the Wharton's jelly. In 1994, Strong et al found a way to unify the description of cord coiling and introduced the 'umbilical coiling index' (UCI), which is the number of coils in the cord divided by the cord length in centimeters.[1] Rana J et al[2] did the frequency distribution of umbilical cord index (UCI) and Umbilical cords have been grouped as hypocoiled (UCI less than 10th percentile),normocoiled (UCI between 10th–90th percentile and hypercoiled (UCI More than 90th percentile).It is believed that abnormal cord coiling is a chronic state, established in early gestation, that may have chronic (growth retardation) and acute (fetal intolerance to labor and fetal demise) effects on fetal well being.[1] The association shows wide variations among the various

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studies done so far.Various reports have shown that abnormal coiling index is associated with adverse perinatal outcomes.[1, 7,9-13] Other studies did not show significant association. [3, 16, 17]

Material & Methods

The present prospective study was conducted on 200 randomly selected Indian pregnant women with singleton pregnancy at POG ≥37 weeks who came for delivery or cesarean section in the Department of Obstetrics and Gynecology of Artemis Hospital Gurgaon, a tertiary care teaching hospital serving, a predominantly economically secure urban population. From June 2017 to May 2018. The study was reviewed and approved by hospital scientific and ethics review committee.

Inclusion criteria

Patients with Singleton pregnancy with live fetus at POG ≥37 weeks who underwent vaginal delivery or cesarean section were included in this study. **Exclusion Criteria -**patients with multi fetal gestation, Congenitally malformed fetus on USG**,** patients with history of Smoking and drug abuse and those who were for cord blood banking were excluded from the study .

Sample-size was calculated according to the following formula

Formula:

$$n = \frac{z_{\alpha-x}^2 p(1-p)}{m^2}$$

N = n/ (1+ ((n-1)/F) Where N is required sample size for the finite population and n is sample size for infinite population. Taking the standard value of z is 1.96 and 3.2 % margin of error our required sample size for the (finite population) study was **N ~ 198.**

Methodology

Patients were selected after ruling out the exclusion criteria and taking written informed consent. Gestational age was calculated by the first day of last menstrual period in those who were sure of dates and had regular menstrual cycles. In those patients who were not sure of dates or had irregular cycles, a first trimester ultrasound was used for dating. Information sheet was provided to the participants. Demographic and clinical data were recorded in predesigned performa. Detailed examination was done and patients were managed as per standard hospital protocols. These women were closely followed up for the entire period of labor and post partum till discharge from the hospital. Maternal and neonatal details were collected including antepartum, intrapartum and post partum till discharge from the hospital.

Calculation of UCI-After vaginal delivery or cesarean section, after separating the baby from the umbilical cord, the cord was tied and cut close to the placenta. Without being stretched, the cord was examined. The entire umbilical cord was measured in centimeter including the length of the placental end of the cord and the umbilical stump on the baby. The numbers of complete coils (360 degree spiral course) were counted and UCI was calculated by the formula (the total number of coils / total length of cord in centimeters). The percentile value of the umbilical coiling index was calculated. The UCI less than 10th percentile and more than 90th percentile were considered as hypocoiled and hypercoiled respectively.

The antenatal(maternal age, parity, gestational age, gestational hypertension(GHT), gestational diabetes mellitus (GDM) and IUGR), Intrapartum(mode of delivery, fetal heart rate (FHR) abnormalities,meconium stained liquor (MSL) and neonatal factors (Apgar score, birth weight and admission to neonatal intensive care unit (NICU) were recorded. The data obtained was entered and managed in Microsoft Excel 2010 spreadsheet and

analyzed. Variables were summarized into means or medians for continuous variables and percentage for categorical variables. The baseline characteristics of maternal age and parity were compared between groups with normal and abnormal UCI to ascertain their comparability

Statistical Analysis

The Kolmogorov–Smirnov tests were performed to assess normality. The continuous data was shown as Mean ±Standard Deviation and categorical data was represented as absolute numbers and percentages .For continuous data parametric data were analyzed with student's T-Test/ Z-Test. Non-parametric data were analyzed with the Mann–Whitney U-test. Nominal categorical data between the groups was compared using Chi-square test or Fisher's exact test as appropriate. Correlation used for measuring the linear relationship between two continuous variables. All major data analysis packages as well as spreadsheets, such as Microsoft Excel used as per requirement. For all statistical tests, a p value less than 0.05 was taken to indicate a significant difference.

Result and Discussion

The mean UCI in our study was 0.21 ± 0.08 which was similar to the study done by Kikelomo T. Adesina et al (0.21 ± 0.099) and Sabrie(0.20 ± 0.08), in their respective studies.[3,4] This agreement confirms that our sample population was appropriate for conducting this study

The value for the 10th percentile was calculated as 0.11coils/ cm and the value for the 90th percentile came out to be 0.32coils/ cm. Accordingly, the division of cases was as follows:hypocoiled group-(9.50%), normocoiled group (81%)and hypercoiled group(9.50%).The average maternal was 30.66 years. The maximum number of patients were in the age group 31-35 years (table1).

TABLE 1- AGE DISTRIBUTION

Age (years)	No. of patients	Percentage
20-25	20	10
26-30	72	36
31-35	90	45
36-40	18	9

Majority of the patients were nulliparous (table2).

TABLE 2 - PARITY DISTRIBUTION

Parity	No. of patients	Percentage
0	121	60.50
1	75	37.50
2	3	1.50
3	1	0.50

The mean gestational age at the time of delivery was 38 weeks with standard deviation of ±2.98 (table3).

TABLE 3 - GESTATIONAL AGE DISTRIBUTION

Group	GA (< 39 Weeks)	GA (≥ 39 Weeks)
Hypocoiled	14	5.00
Normocoiled	115	47.00
Hypercoiled	13	6.00

9.5% patients had gestational hypertension, gestational. diabetes mellitus complicated 11% of pregnancies.

24% of pregnancies were complicated by intrauterine growth restriction (IUGR) {AC<10th centile on USG}.15.5% of patients had non-reassuring fetal heart rate during some stage of labor in the form of prolonged decelerations, loss of beat to beat variability and type 1 decelerations. 10 % patients had meconium staining of liquor (any amount of meconium).33.5 % of the patients delivered vaginally and 66.5% had an operative delivery (10.5% vacuum, 31% elective LSCS and, 25% emergency LSCS .10% emergency cesarean sections were for fetal distress).

16% of the new born were low birth weight babies (birth weight<2.5 kg). All were appropriate for the gestational age. The mean birth weight came out to be 2.9 kg. Minimum birth weight was 2 kg and maximum birth weight was 4.2 kg. All babies had Apgar scores in the range of 6-8 at 1 minute and 5 minutes interval. None of the neonates required admission to NICU for respiratory distress (table 4)

TABLE 4- UCI and its association with maternal and perinatal outcomes

GHT	NO (n= 181)	YES (n= 19)	P value
Hypocoiled	17	2	P1 0.876
Normocoiled	148	14	
Hypercoiled	16	3	P2 0.551
GDM	NO(n= 178)	YES (n= 22)	P value
Hypocoiled	17	2	P1 0.756
Normocoiled	144	18	
Hypercoiled	17	2	P2 0.756
IUGR	NO (n= 152)	YES (n= 48)	P value
Hypocoiled	13	6	P10.708
Normocoiled	122	40	
Hypercoiled	17	2	P20.272
CTG	(R) (n= 169)	(NR) (n= 31)	P value
Hypocoiled	16	3	P10.928

Cont... **TABLE 4- UCI and its association with maternal and perinatal outcomes**

Normocoiled	140	22	
Hypercoiled	13	6	P20.085
MSL	(NO) (n= 180)	(YES) (n= 20)	P value
Hypocoiled	19	0	P10.285
Normocoiled	145	17	
Hypercoiled	16	3	P20.756
Mode of Delivery	Normal (NVD) (n= 67)	Instrumental (VACUUM) (n= 21)	P value
Hypocoiled	3	3	P10.933
Normocoiled	57	17	
Hypercoiled	7	1	P20.259
	(NVD) (n= 67)	Emergency LSCS (n= 50)	P value
Hypocoiled	3	3	P10.933
Normocoiled	57	37	
Hypercoiled	7	10	P20.135
LBW	NO (n= 168)	YES (n= 32)	P value
Hypocoiled	13	6	P10.104
Normocoiled	139	23	
Hypercoiled	16	3	P20.874

GHT=gestational hypertension, GDM= Gestational diabetes mellitus, IUGR= Intrauterine growth restriction, CTG= Cardiotocography, MSL= Meconium stained liquor, p_1=p value calculated for hypocoiled cords p_2= p value calculated for hypercoiled cords

Table 5: Studies examining umbilical cord coiling (UCI) index and adverse pregnancy outcomes

Study	N	Hypocoiled	Hypercoiled
Strong et al.1 1994	100	Aneuploidy, fetal distress,MSL	CTG abnormalities
Kikelomo T. Adesina et al3(2017)	436	No adverse perinatal outcome	congenital abnormalities., No other adverse perinatal outcome
Ezimokhaiet al.7 2000	657	-	LBW, LBW, fetal distress

Cont... **Table 5: Studies examining umbilical cord coiling (UCI) index and adverse pregnancy outcomes**

Chitra et al9	1000	hypertensive disorders,abruptio placentae, preterm labor, oligohydramnios, and fetal heart rate abnormalities.	diabetes mellitus, polyhydramnios, cesarean delivery, congenital anomalies, and respiratory distress of the newborn.
De Laatet al.10 2007	565	fetal anomaly, low Apgar score at 5 min	IUD, PTB, fetal anomaly, hypoxia, LBW
Kashanian et al11 2006	699	Apgar score at 5 min, AFI <5	Low Apgar score at 5 min, AFI <5, meconium, LBW
Patil 12et al.,(2013)	200	low Apgar MSL, and NICU admissions	intrauterine growth restriction, LBW
Devaru and Thusoo13,(2012)	100	low Apgar score at 5 min MSL,	intrauterine growth restriction
Ndolo JM,92018)16	430	No association found with adverse perinatal outcome	No association found with adverse perinatal outcome
van Dijk 17	122	No association found with adverse perinatal outcome	No association found with adverse perinatal outcome
Present study	200	No association found with adverse perinatal outcome	No association found with adverse perinatal outcome

In our study no statistically significant association found with GHT and abnormal UCI (p1=0.876& p20.55). Shilpa et al and Mittal A et al also did not find significant association between pre eclampsia, and abnormal UCI.[5, 6] Ezimokhai M et al, Gupta et al and Chitra et al demonstrated a significant association between hypocoiling preeclampsia and GHT.[7, 8, 9] They gave explanation that the coiled umbilical cord, because of its elastic properties, is able to resist external forces that might compromise the umbilical vascular flow. The coiled umbilical cord acts like a semi erectile organ that is more resistant to snarling torsion, stretch, and compression than the noncoiled one. This might explain the association of hypocoiling with preeclampsia and GHT .

In our study diabetes mellitus (DM,) was not found to be significantly associated with both hypocoiled and hypercoiled cords ($P1$=0.756, p2=0.756). Shilpa et al & de Laat et al also did not find any statistically significant association between GDM and abnormal UCI.[5, 10] Ezimokhai et al however, found significant association of GDM with both hypocoiled and hypercoiled.[7] Chitra et al also observed that the incidence of GDM was statistically significant in hypercoiled subjects.[9] None of the patients enrolled in

the study done by Mittal A et al developed gestational diabetes mellitus (GDM) and hence they could not study its association with abnormal coiling index.[6] Intrauterine growth restriction (IUGR) was noted in 48 (24%) cases in our study, six patients belonged to the hypocoiled group and two patients belonged to the hypercoiled group. IUGR and abnormal coiling were not found to be significantly associated (p1=0.708, p2=0.272). Ezimokhai et al, de Laat et al, Patil et al and Devaru &Thusoo in their respective studies noted the significant association between hypercoiling and small for gestational age fetuses.[7, 10,, 12,13]

Abnormal coiling index was not associated with FHR variations in our study (p1=0.085,p2=0.089). Similar results were seen by Kikelomo T. Adesina et al and Shilpa et al. [3,5] FHR variations were found to have a highly significant association with both hypocoiled and hypercoiled in the study done by Chitra et al (both instances *P* <0.001).[9] Strong et and de Laat el al also found a consistent association between intrapartum FHR decelerations and abnormal UCI.[1,10]According to them hypocoiled and hypercoiled cords are less flexible or more prone to kinking and torsion which makes them less tolerant to withstand the stress of labor. Rana J et al. and Ercal T et al found FHR decelerations to be significantly associated with hypocoiled cords[2, 14]Rana J et al explained that coiling provides turgor and compression resistant properties to the cord which become compromised as the cord becomes hypocoiled.[2]

There was no statistically significant association between umbilical coiling and meconium staining of liquor in the present study. Similar results were shown in the study done by Kikelomo T. Adesina et al and Jo YS et al.[3, 15] Meconium staining of the amniotic fluid was found to have a significant association with both hypocoiled (*P* =0.020) and hypercoiled cords (*P* <0.001) in the study done by Chitra T et al. [9] Similar findings were noted in studies done by Strong et al

and Ezimokhai et al. They did not offer a specific explanation for the observation.[1, 7]

Operative deliveries did not have significant association with extremes of UCI in our study including instrumental deliveries (p1=0.933,p2=0.259) and Emergency Cesarean deliveries (p1=0.933 ,p2=0.135). Instrumental deliveries did not have any association with extremes of UCI in the study conducted by by chitra T et al[9]Rana J et al and Eric T at el found positive association between operative delivery, for fetal distress and abnormal UCI.[2, 9, 14]

An Apgar score of < 4 at 1 min and a score of < 7 at 5 min were taken as poor Apgar scores at 1 minute and 5 minute respectively. No babies in either hypocoiled or hypercoiled groups had a poor Apgar score hence no association could be calulated. Low Apgar was found to have a significant relationship with both hypocoiled and hypercoiled in the study done by Gupta et al, Chitra T et al , and Kashanian et al.[8,9,11]None of the babies in the study group were admitted to the NICU and hence its association with abnormal coiling indices could not be studied. Our study results are comparable to the study done by Kikelomo T. Adesina et al and van Dijk et al.[3, 17]

No statistically significant association was found between abnormal umbilical coiling and LBW (p1=0.104, p2=0.874) in our study. Both hypocoiling and hypercoiling were found to be significantly associated with low birth weight in the study done by Mittal et al & Chitra T et al. [6,9] JoYS et al did observe that hypocoiling was associated with low birth weight, their study did not find any relation between birth weight and hypercoiling.[15]. de Laat et al and Kashanian et al also found a significant relationship between hypercoiling and low weight at birth.[10,11]

Conclusion; No statistically significant association was found between abnormal UCI and adverse perinatal outcomes in this study. Most likely

reason of this conclusion can be attributed to our well equipped centre with availability of CTG(continous tocography) machine for all laboring patients where appropriate actions were taken well on time in case of non- reassuring CTG. Also all patients included in the study were booked and received good antenatal care throughout and delivered at term gestation. Other factors included were economically secure, well educated patients.The association shows wide variations among the various studies done so far. Some studies have reported significant association between abnormal UCI and adverse perinatal outcomes. [1,7, 9-13] whereas other studies are similar to the present study.[3, 16, 17] Further studies need to be done for large sample size.

Limitation of the study Small sample size

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COVID-19 Management, Treatment and Vaccination Strategies as the Most Efficient Host Manipulation by SARS-CoV-2: Reappraisal of a Serious Global Public Health Crisis

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Abstract

We make a critical objective analysis of the different management, treatment and prevention strategies employed the world over to tackle the COVID-19 pandemic and try to bring some insight into the fact that they all may ultimately be efficient host manipulation by the SARS-CoV-2 virus for purposes of its unrestrained propagation. We discuss issues relating to long term implications of host-pathogen coevolution and viral pandemic periodicity.

Keywords: COVID-19, SARS-COV-2, Pandemic, Host manipulation, vaccination, NPI

Introduction

Human beings are the end products of the evolutionary process of physiological and psychological niche construction by prokaryotes, which on their turn, are the niches of the viruses such that every trait in higher eukaryotes can be seen as the result of niche construction by the lower placed organisms[1,2]. This is implied by human microbiota making us their habitats and far outnumbering us[3]. Only an in-depth study of diffuse co-evolution can give us any insight into the role of micro-organisms in our evolution[4]. While our fully developed notion of "self" gives a false ownership of our bodies, the niche constructors and manipulators see only their niche[1,2,5]. The SARS-CoV-2 for example, sees only the living-moving human lungs available for its propagation, similar to our making safe habitats ignoring what befalls other organisms, so typical of all instinctive niche constructors[6-8]. This indomitable force of instincts is the driver of evolution[9].

In this article, we propose that without our knowledge, SARS-CoV-2 may be continuously and successfully manipulating us, utilizing all our resources and resourcefulness to its advantage, in and through our seriously planned management, treatment and prevention strategies.

COVID-19 Management strategies

The prominent NPIs (Non Pharmaceutical Interventions) like strict lockdowns, shutdowns, social distancing, mask use, frequent hand-washing and sanitizer sprays have their own rational support base and have proved only temporarily successful in restricting the spread in patches, but none could completely arrest it. Even healthcare professionals donning full PPE (Personal Protective Equipment),

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taking all precautions to the very letter, got infected and died in thousands the world over, and nobody knows how many unsuspecting thousands they might have infected!

A lockdown is usually imposed for a period of a week to a few months depending on the infection-rate in a region. But there have to be periodic relaxations when at least shops for eatables would open. During such relaxation it becomes impossible to ensure social distancing rendering lockdowns ultimately less effective[10]. From just one infected person, entire families/colonies get easily infected because of high concentration during lockdown!

A shutdown with curfew is more stringent, usually for shorter periods like weekends to a week/fortnight with complete cessation of all movements except emergencies. The post-shutdown infection rate is proportionally magnified unless it is for very long duration, which is practically impossible and inhuman to impose[11]. due to over-crowding in frantic buying of essential commodities following shutdown, again failing social distancing and other measures, giving SARS-CoV-2 an advantage!

Social distancing, though easier now with social media networking enabling communication and commerce online, is ultimately a matter of cultured habit which we all simply are accustomed with from the beginning of civilization. We tend to come close to each other in any interaction for effective communication, touch each other in adoration or affection and hug each other in joy. It is difficult to suddenly put a full stop to all these human and hormonal ways of interaction. We must not forget gene-culture coevolution for millennia in social organisms like human beings which has gotten such patterns of human behavior deeply ingrained in the genetic and psychic make up[4]. When we are forced for prolonged abstention from all these deeply ingrained behavioral patterns for, hormonal

imbalances and psychological rebellion against such impositions induce flagrant violations, thus spreading the virus!

Masks are absolutely essential for COVID management but in India, for example, with mostly hot and humid climatic conditions, to have a mask on the face creates many additional complications due to profuse sweating in the sensitive face area leading to other skin diseases. Masks deprive people of sufficient oxygen while performing laborious menial works leading to serum toxicity. Worn for hours without end or used repeatedly, they make matters even worse. Low-cost road-side masks used by the poor majority ensure no protection but only reduce oxygen intake!

Frequent hand-washing and hand-sanitization have been popularized to contain the spread of the virus and other pathogens such as salmonella and adenovirus etc. But, done too frequently, they also remove lot of healthy cells and beneficial microorganisms thereby endangering our wellbeing and making us more vulnerable to certain other infections. The quality of soaps and sanitizers also determines the extent of harm caused. In India, the low-cost, lower-grade, non-branded sanitizers made big sales during the two years of the pandemic making people more prone to such infections, which reduce immunity and provide easy vehicles for SARS-CoV-2.

It is practically impossible, given the conditions of population, per capita income and living status in tropical economies, to ensure implementation of perfect management strategies with approved quality masks, soaps, sanitizers etc. for curbing the spread. Analyses show that unless extremely rigidly applied for inhumanly longer durations, NPIs have limited success in containing the pandemic all over the world[12].

Treatment strategies

The range of drugs prescribed for treatment of

COVID 19 is truly impressive though none has been successful so far in any satisfactory measure[13]. The first wave in early 2020 was proposed to be tackled by administering Hydroxychloroquine which later proved to be ineffective, only after a global business boom in its manufacture and export. Then the antibiotics like amoxicillin (antibacterial), Doxycycline(antibacterial), ivermectin (antihelmintic against roundworms) and azithromycin (antibacterial) were prescribed in various combinations and finally the preparations such as remdesivir (used for treating Ebola), favipiravir (used for treating novel flu) along with steroids were used quite unsuccessfully. Administration of steroids (e.g. dexamethasone) as anti-inflammatory was later found to be causing more harm than cure. In critical cases, IL-6 (Interleukin-6) blockers such as Tocilizumab in patients with comorbidities due to other fungal, bacterial or tubercular infections have been tried with but limited success. Antibody cocktails (e.g. Casirivimab+Imdevimab) too failed in case of patients on external oxygen support. Plasma therapy too was widely employed but later retracted. There is also acute shortage of all these[14].

All antibiotics and antivirals have their own adverse reactions. The excessive use of Zincovit has been suspected to be a reason for higher incidence of black fungus infection among COVID -19 patients. The variegatedness of symptoms exhibited makes it difficult to discern the true symptoms of COVID-19 from the offshoots or adverse drug reactions or after effects[15]. Such trials without proper appraisal of the efficacy of any of them singly or in combination has led to the deaths of millions of people the world over but the medical science fraternity is unrepentant as no responsibility can be fixed on either the healthcare professionals or the pharmaceutical companies or the allopathic healthcare system itself.

Finally, a claimed cure in the form of 2 DG (2-deoxy-D-Glucose) first proposed and studied by Balakrishna *et al* has been developed by INMAS (Institute of Nuclear Medicine and allied Sciences) and DRDO (Defence Research development Organization) in collaboration with Dr. Reddy's laboratories[16]. It has been approved by DCGI (Drugs Controller General of India) for emergency use serious cases of COVID-19 in India in May 2021. The scale of infections in the second wave had reached such gigantic proportions that it was like drowning man catching at a straw for anything that made news as a COVID-cure!

One of the biggest disasters occurred in India in April-May 2021 when the medical fraternity suddenly hiked the hypoxia level from 90% O_2 saturation to 95%, leading to a frantic hunt for oxygen cylinders across the country precipitating a crisis of unprecedented proportions[17]. People having a little breathing difficulty much below the level of true hypoxia, were suddenly put on oxygen or ventilators and shifted to ICUs! Neither were so many ICUs available, nor oxygen cylinders nor ventilators nor hospitals. To make the matters worse, digital pulse-oximeters came to be available to the public at affordable costs making them panic with oxygen level self-assessments that led them to throng the already over-crowded hospitals in large numbers, even if they were asymptomatic or mildly symptomatic, not really warranting hospitalization. Nobody knows why and how such a crisis was so effectively engineered, but whatever be the motives of the perpetrators, it can finally be ascribed to successful host manipulation by the SARS CoV-2 virus!

Vaccination strategies

Race for pharmaceutical supremacy and financial gains from marketing of vaccines led counties to enter a vaccine race, each coming up with its own COVID-vaccine with record-breaking fastness with

efficacy between 60% to 95% and protection for just *one year*[18]. Mass vaccination started everywhere despite the medical community knowing it well that the RNA virus undergoes continuous mutations to eventually completely fail any vaccination programme. Common people are fooled by aggressive neuro-marketing propaganda[19] into believing that vaccination is a surest protection against COVID-19, while the fact remains that every day hundreds of post-vaccination deaths occur as sufficient antibodies fail to be generated. Those who are not as immune-compromised, somehow survive vaccination, but only for an year or so, after which they are as prone to (re) infection as the non-vaccinated!

A vaccine contains antigens, weakened or dead forms of the pathogen, toxins of the pathogens or surface proteins etc and as such is a mild form of infection only, which invites the immune system to manufacture sufficient antibodies against the original pathogen[20]. Antibody-induced enhancement is a well known phenomenon in pathogen mutations in response to vaccines[21-23]. It leads to new vaccine-induced variants and mutants of the original pathogen and thus becomes a potent new source of more severe forms of the pandemic. No wonder, we have ever newer variants of concern(VoC) coming up every few days and some bringing wave after wave!

Discussion

The ultimate failure of all our strategies would occur when the SARS-CoV-2 or any of its mutant strains maps to a human oncovirus strain by continuous mutations while consistently growing in its infectivity. The disorder theory of cancer proposed by us envisages cancer as a primordial agent of disorder as opposed to the cosmic ordering principle(COP) of consciousness[24-29]. Thus, the SARS-CoV-2 would be an effect of the oncovirus and may indeed mutate enough to get mapped to oncoviral strains. Every experience leaves its mark in the genome and as such

the SARS-CoV-2 would certainly leave its imprints in some seed form in the genome which would make it possible for it to reappear after an interval in some mutant form bringing another pandemic[30-32].

We struggle against the virus as much as it does against us and finally it may result in an evolutionary +/+ for both, but not before we suffer a huge number of human casualties[33]. We will gain immunity against the virus and its variants and that will lead to its suppression for about a century or so before it reappears in the form of another pathogen precipitating another pandemic! Prey Predator Relationships (PPR) are ubiquitous and in this pandemic the hosts are themselves the vectors leading to reduction of the three-player set-up of host-vector-pathogen to just a two-player set-up: human and virus[34-36].

Conclusion

We have discussed at length the various management, treatment and prevention strategies employed so far in the COVID-19 pandemic under the premise that in all these processes the humans are being manipulated by the SARS-CoV-2 virus in extremely inscrutable ways leading to its unrestrained propagation. Questions still open are: When and how this pandemic will finally end? What kind of coevolution will lead to complete immunity against the virus? Was there development of complete immunity against Spanish flu when it ended a hundred years back? We hope that future researches will shed more light on these important issues so that we will gain important new insights and learn the lessons to face the next pandemic with more efficacious strategic preparedness.

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Chemotactic Cytokine Receptor 5 Genetic Polymorphism in Diabetic Nephropathy of the Type 2 Diabetes Mellitus

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Abstract

Background and Aim: The inflammatory process can be involved in the pathophysiology of diabetic nephropathy (DN). One of the cytokine receptors in the inflammatory process is Chemotactic Cytokine Receptor 5 (CCR5), whose genetic variation can affect the incidence of DN in several populations in the world. This study aims to determine the proportion of CCR5 gene polymorphisms with DN in type 2 diabetes mellitus patients in Bali.

Method: This study used a case-control design in 144 DNA samples of patients with type 2 diabetes mellitus. They were examined for the polymorphisms of the CCR5 gene by PCR-RFLP and then analyzed using Chi-Square statistical test. The p value <0.05 was significant.

Results: The proportion of males more than females in subjects with diabetic nephropathy (p = 0.000). Duration of diabetes and systolic blood pressure were higher in subjects with diabetic nephropathy (p = 0.002; p = 0.002) respectively. The polymorphisms of the CCR5 gene did not differ significantly in subjects with and without diabetic nephropathy (p = 0.224).

Conclusions: Gender, systolic blood pressure and duration of diabetes were associated with diabetic nephropathy, while CCR5 gene polymorphisms were not significantly associated with diabetic nephropathy in type 2 diabetes mellitus patients in Bali.

Keywords: diabetic nephropathy, Chemotactic Cytokine Receptor 5, gene polymorphism

Introduction

Diabetes mellitus (DM) is a collection of metabolic diseases characterized by hyperglycemia due to defects in insulin secretion or action. The prevalence of this disease is increasing rapidly worldwide and is one of the major health problems. In 2013, 382 million cases of DM are estimated worldwide and will increase to 592 million in 2035[1]. Complications in diabetes include microvascular and macrovascular. One of these complications is diabetic nephropathy (ND). Diabetic nephropathy can occur in 30-40% of patients with type 1 and type 2 diabetes mellitus[2].

Various factors have been described that can be involved in the pathophysiology of ND, namely hemodynamic and metabolic changes, oxidative stress, activation of the renin-angiotensin system and

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most recently the role of the inflammatory process which can lead to disease progression towards ND(2). This inflammatory process includes infiltration of the renal compartment by lymphocytes and macrophages resulting in local production of cytokines and chemokines in the kidney[3]. Signs of ND include albuminuria, glomerular abnormalities, changes in podocyte structure, decreased nephrine expression and increased filtration rate[2].

The mechanism underlying the regulation of cytokines in the kidney of DM patients is still unclear. One that is currently being investigated is the presence of genetic variations in the genes encoding inflammatory cytokines that cause susceptibility to ND by changing their function or expression. Cytokines and chemokines that increase in expression (production) during the inflammatory process in the glomerular membrane of rats with diabetes are monocyte chemoattractant protein (MCP-1), CCR5, Interleukin 1, 6, 18, TNF-α, TGF-β1, TF, Smads, adhesion and adipokin molecules[2].

Chemotactic Cytokine Receptor 5 (CCR5) is a beta chemokine receptor which is expressed on the surface of monocytes. The ligand of this receptor, RANTES, is secreted by mesangial cells from the kidneys during the inflammatory process. An SNP of the CCR5 gene (G59029A) has been studied to be associated with the incidence of diabetic nephropathy in several populations. In Japanese and Asian populations it has been found to have a strong association with diabetic nephropathy in patients with type 2 diabetes mellitus[3,4,5]. The CCR5 gene with the A allele can be concluded to be a risk factor for diabetic nephropathy and the G allele as a protective allele[6].

CCR5 is located at 3q21.3 position on the chromosome. The *CCR5*□59029A/G polymorphism has been reported in the promoter region of the *CCR5* receptor gene. According to Nazir et al.[1] , CCR5 rs1799987 is the most studied genetic variant

in inflammatory cytokines with the genetic variant rs1799987 in CCR5 gene A allele being the risk factor for diabetic nephropathy. The G allele of rs1799987, however, is considered as a protective allele[7]. Studies indicated that the *CCR5*-59029 A/G genotype results in increased expression of this receptor by peripheral blood mononuclear cells of individuals with this genotype, and therefore it is probably the genotype regulating the expression of *CCR5*[4].

The proportion of polymorphisms of a gene is different in each population. Polymorphism is closely related to race, so that racial differences allow for different proportions of the polymorphism. Ethnic groups and races in Indonesia are different from those in Japan and China, and they may differ in the proportion of polymorphisms. In Indonesia, especially in Bali, there has been no research on the proportion of polymorphisms in the CCR5 gene. Therefore, it is necessary to further investigate the proportion of these polymorphisms and how they are correlated to clinical patients with diabetic nephropathy.

The contribution of this research to knowledge of genetics such as, there is CCR5 gene polymorphism in the population of type 2 diabetes mellitus patients in Bali. Although the results showed no significant association of CCR5 gene polymorphism to diabetic nephropathy, it provides an idea of the possibility of other factors in ND pathogenesis related to inflammation and CCR5.

Materials and Methods

Study design and patients

This study used a case-control analytic study design by analyzing data on the polymorphism of the CCR5 gene in DNA samples stored in the Biomolecular Laboratory of Warmadewa University. The research conducted in 8 months from March to October 2020. Based on the sample size formula, the minimum sample required is 72 per group, so the total

sample is 144 samples. The sample was selected by simple random sampling.

Laboratory, anthropometric and clinical data collection

The CCR5 gene polymorphism examination used the PCR-RFLP method.The PCR-RFLP method consists of polymerase chain reaction (PCR) and digestion by enzymes to produce cut DNA bands according to certain alleles. The primers of the CCR5 gene are: Forward: 5′-CCCGTGAGCCCA TAGTTAAAACTC-3′ and Reverse:

-5′-TCACAGGGCTTTT CAACAGTAAGG-3′. The annealing temperature during PCR is 64^0C. The PCR product was then digested with the Bsp1286I enzyme with digestion products in the form of the AA allele (137 bp and 131 bp), the AG allele (268 bp, 137 bp and 131 bp) and the GG allele (268 bp).

Statistical Analysis

After obtaining the research data, it is tabulated and analyzed using the Chi Square statistical test by SPSS ver.22. The p value <0.05 was significant.

Results

Table 1: Characteristics of the sample

Characteristics	N	Nephropathy	Non-Nephropathy	p
Gender (n, %)	144	72	72	0.000*
Male	85 (59%)	53 (62%)	32 (38%)	
Female	59 (41%)	19 (32%)	40 (68%)	
Age in year In year (mean, SD)	144	60.79 (10.9)	60.17 (8.91)	0.923
Duration of DM in year (mean, SD)	123	11.28 (5.89)	8.06 (5.85)	0.002*
Body Mass Index (BMI) In kg/m2 (Mean, SD)	144	23.71 (4.13)	24.63 (4.12)	0.315
Systolic BP In mmHg (mean, SD)	144	138.09 (24.30)	127.74 (17.06)	0.002*
Diastole In mmHg (mean, SD)	144	77.26 (11.14)	76.81 (8.05)	0.909
Fasting Blood Glucose In mg/dL (mean, SD)	131	149.55 (48.23)	155.57 (48.41)	0.514
Total Cholesterol In mg/dL (mean, SD)	136	188.60 (54.58)	195.64 (42.93)	0.236
HDL In mg/dL (mean, SD)	136	53.92 (20.02)	51.58 (14.10)	0.653
Triglyceride In mg/dL (mean, SD)	136	144.92 (95.41)	131.94 (68.77)	0.625

*p<0.05: statistically significant

Based on the data obtained from the archives, the characteristics of the 144 samples analyzed can be seen in table 1. The sample of males is more than females and the proportion are significantly more in the sample group with diabetic nephropathy. Age, body mass index, diastolic blood pressure, fasting blood glucose levels, total cholesterol, HDL and triglycerides were not significantly different between the two sample groups. Systolic blood pressure and duration of suffering from type 2 diabetes mellitus were significantly higher in the sample group with diabetic nephropathy.

Table 2: CCR5 gene polymorphism in sample with and without diabetic nephropathy

	Nephropathy	Non-Nephropathy	p
Genotype GG (%) AG (%) AA (%)	12 (16.7) 40 (55.6) 20 (27.8)	18 (25.0) 30 (41.7) 24 (33.3)	0.224
Alel G (%) A (%)	64 (44.4) 80 (55.6)	66 (45.8) 78 (54.2)	

After PCR-RFLP method for samples as in figure 1, genetic variation data were collected. Analysis of the results of the CCR5 gene polymorphism found that there was no significant difference in the proportion of CCR gene polymorphisms in samples with diabetic nephropathy and without diabetic nephropathy. Table 2 also shows that the CCR5 gene polymorphisms occurred in samples with diabetic nephropathy and without diabetic nephropathy but it was not statistically significant.
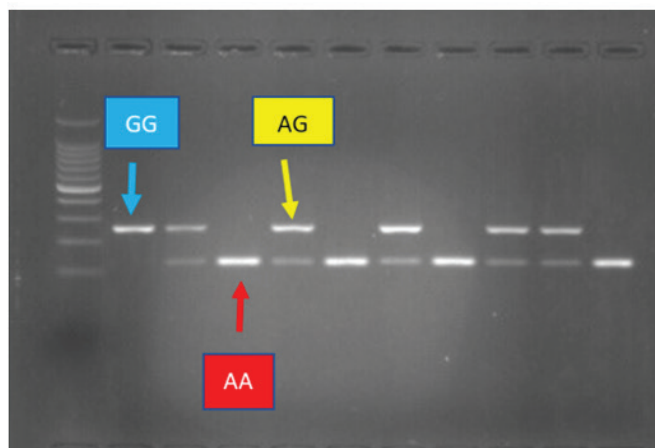
Figure 1. Results of PCR-RFLP of CCR5 gene in samples

Discussion

The sample characteristics data in this study indicate that the factors of gender, duration of diabetes and systolic blood pressure have a significant relationship with diabetic nephropathy. These can be seen in table 1. Male gender is more in subjects with diabetic nephropathy and this is statistically significant. Estrogen hormone in women can increase the availability of nitric oxide (NO) and reduce oxidative stress so that it has better endothelial function of blood vessels than men. In addition, testosterone promotes the progression of chronic kidney disease in non-diabetic rats[8]. These conditions cause more men to suffer from kidney problems than women[9].

This study found that the duration of diabetes mellitus was higher in subjects with diabetic nephropathy. The duration of diabetes mellitus is related to the older age of the subject. Increasing age causes cell aging which involves cellular signaling mechanisms that disrupt the capacity of cells to repair themselves[10]. Older people tend to experience poorer nutritional status, are frail and weak, which increases morbidity and mortality[11]. In diabetic patients it appears that patients with a longer duration of diabetes have a greater risk of developing diabetic nephropathy with a worse prognosis[12].

As seen in the table 1 too, systolic blood pressure, which indicates a hypertensive condition, was also more prevalent in subjects with diabetic nephropathy than in subjects without diabetic nephropathy. Hypertension and hyperglycemia together aggravate the patient's condition with diabetes mellitus and increase the risk of developing diabetic nephropathy. The uncontrolled increase in blood pressure and blood sugar levels can increase the production of reactive oxygen species (ROS) and activate NFκB via metabolic pathways, resulting in albuminuria and accumulation of ECM as a result of apoptosis in podocyte, vascular and pericite cells[13].

Increased intraglomerular pressure causes structural disturbances that aggravate interstitial fibrosis and glomerular sclerosis[14]. Hyperglycemia induces cellular hypertrophy of podocytes and cessation of the cell cycle and decreased expression of nephrine proteins resulting in impaired glomerular capillary selectivity. This induces proteinuria and focal and global sclerosis in the kidney tissue[15].

Several immunological factors such as chemokine-receptor axis have now been shown to play an important role in diabetes and its complications[16]. CCR5 is a protein-G receptor of the CC (CCL3, CCL4, CCL5) chemokine, which attracts immune cells to sites of infection, injury and inflammation, including diabetic nephropathy. These receptors are expressed on the surface of monocytes. The ligand of this receptor, RANTES, is secreted by mesangial cells from the kidneys during the inflammatory process. Based on previous research, CCR5 59029A can increase CCR5 expression on mononuclear cells in peripheral blood, so that genotypic changes can regulate CCR5 gene expression. The more severe the glomerulosclerosis, the more monocyte and macrophage infiltration appears to be. By increasing the expression of CCR5 will increase the recruitment and differentiation of these cells into macrophages in the glomeruli up to several times[17].

An SNP of the CCR5 gene (G59029A) has been studied to be associated with the incidence of diabetic nephropathy in several populations. In Japanese and Asian populations it has been found to have a strong association with diabetic nephropathy in patients with type 2 diabetes mellitus[3,4,5,18]. The CCR5 gene with the A allele can be concluded as a risk factor for diabetic nephropathy and the G allele as a protective allele[6]. Yahya et al. found the same results in Indian and Malay ethnic groups[19]. This is also similar to the results of Caucasian type 1 DM patients in Ireland[20] and type 2 DM patients in Finland and France[21].

Several studies have even tested the antagonist agents of CCR2 / CCR5 as therapy in renal impairment in diabetes in both mice[22] and humans[23], but further research is needed on its long-term effects.

The results of this study as showed in table 2 indicate that ethnic groups in Bali have no significant relationship between the CCR5 gene polymorphism and the incidence of diabetic nephropathy. The results of this study are in line with the results of research from Setyono in year 2008 on Javanese ethnicity, which did not get significant results on the relationship between this CCR5 gene polymorphism and diabetic nephropathy[24]. The association of gene polymorphisms with a disease depends on the ethnicity and race of a population, so it can be said that in the Balinese population, CCR5 gene polymorphism is not a risk factor for diabetic nephropathy.

Although this study yielded good performance, however, there are some limitations in this study:all the participants in this study were Balinese and relatively small numbers. In the implementation, we were not measure the expression of CCR5 gene in blood or urin to confirmation of the genetic varian effects on mRNA of CCR5 or protein CCR5. We analyzed only one SNP rsrs1799987 in the promotor region of CCR5 gene, which maybe does not exclude other regions around this gene.

Conclusions

In this study, data of type 2 diabetes mellitus patients were tabulated and the patient's DNA is examined using PCR-RFLP method so that genetic variations in the CCR5 gene were obtained. Gender, systolic blood pressure and duration of diabetes were associated with diabetic nephropathy, while CCR5 gene polymorphisms were not significantly associated with diabetic nephropathy in Balinese type 2 diabetes mellitus subjects.Further research is needed to ascertain the mechanism involving this gene polymorphism in diabetic nephropathy in patients with type 2 diabetes mellitus

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The Mediating Role of Internet usage on Social Maturity of Young Adults

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Abstract

Social Maturity is the capability to function in an apt and responsible manner. It is an essential facet for the individual as well as society.A socially mature person should be able to make choices, decisions and take proper action in face of challenges. The purpose of this study was to ascertain the mediating role of internet usage on social maturity of male and female young adults. Internet being the most popular source of information, search engine and that ithas already surpassed other means of gathering data. Therefore, studying it in current context is very essential in knowing its influence. For the purpose of study, Social Maturity Scale (VSMS) of NaliniRao (1986)was employed to gather the information. A total of 202 participants were included in the study and analysis was done on the data. Findings suggests the significant role of internet usage on social maturity of male and female young adults.

Key Words: *Social Maturity, Choices, Challenges, Internet Usage*

Introduction

The Internet is the conclusive innovation of the Information Age, as the electrical motor was the vector of mechanical change of the Industrial Age. This worldwide organization of Personal computer in organizations, to a great extent dependent on foundation of remote correspondence, gives omnipresent limit of multimodal, intelligent correspondence in picked time, rising above space. Moreover, for quite a while the spread of the Internet was restricted by the trouble to spread out land-based media communications framework in the arising nations. This has changed with the blast of remote correspondence in the mid twenty-first century. For sure, in 1991, there were around 16 million endorsers of remote gadgets on the planet, in 2013 they are near 7 billion (in a planet of 7.7 billion individuals). Relying on the family and town employments of cell phones, and thinking about the restricted utilization of these gadgets among kids under five years old, we can say that humanity is presently essentially associated, though with extraordinary degrees of disparity in the data transmission just as in the productivity and cost of the help.

It is a known fact that the present generation of adolescents grows up in a media-saturated world. They invest lot of energy on the web and hence invest less time with real individuals while this utilization of the Internet has essentially improved the level of contact accessible it has created a rift between real and reel life.

Earlier the means of communication was exclusively by telephone or mail, which required

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some investment and cost. This has changed radically with the web as online people group across the world. All things considered, Individuals are investing hours of their energy on internet. But then the upsides of the Internet are self-evident, with the way in which individuals associate themselves across the globe.

Social Maturity

The word, Maturity can be understood in two ways –First in context to behaviour that is constant with the morals and expectations of adults and secondly, in context to appropriate behaviour giving to the age of the person under opinion.Social Maturity is the indication of mastery in social behaviour in terms of human relationship, social techniques and social institutions. Social maturity is a unit of key to handle of social relationship.

It has been found that the term social intelligence is mostly used as early as 1920 by Thorndike (Birknerova et al.2010)[1] Social intelligence or Social knowledge mainly connotes the ethical behaviour (for example the ability to know and relate) when eating, when communicating, the ability to gain people's love, so that all that can be learned, if one aligns with it. This means that socially intelligent are those people who are responsive, who recognize the circumstances. In this sense the social intelligence is social norms (rules, customs), the required need to incorporate into society (community) and the capacity to perform different social roles.

Impact of internet on Young adults

Media play anenormouslysignificantpart in the lives of today's youth, who grow up with tablets and smartphones. Mass media is used not only for entertainment purposes, such as listening to music or watching movies, but is also used increasingly for communicating with peers via WhatsApp, Instagram, Snap Chat or Facebook.

Recently, cognitive neuroscience studies have used structural and functional magnetic resonance imaging (fMRI) to examine how the adolescent brain changes over the course of the adolescent years. The results of several studies demonstrate that cognitive and socio-affective development in adolescence is accompanied by extensive changes in the structure and function of the adolescent brain

Significance of this study

Present era is the age of technology more precisely information and communication technology. The reason of conducting this research was to study the influence of internet on the social maturity of young adults.[5]It's been hypothesized that about 95% of all data accessible has been digitized and made open through the web. The web has likewise prompted a total change in correspondence, accessibility of information just as social association. Be that as it may, similarly as with all major mechanical changes, there are positive and negative impacts of the web on the general public as well.

Review of Literature

Ahmed, M.N and Ghosh (2018) studied the social responsibility on the internet.This article examines the marvels of cyberbullying particularly among youngsters. [2]The conversation, in view of an interdisciplinary examination in the fields of cerebrum considers, kid advancement, brain science, social approach, exploitation and Internet contemplates, tests the upsetting wonder of cyberbullying which may bring about self-destruction. It is contended that youths are more helpless than grown-ups on the grounds that they need development concerning limits, for example, thrill chasing, drive control, peer pressure, reward affectability, intellectual handling, sane dynamic and long haul arranging. The article recommends solutions for counter online social ills and contends for dependable participation between

guardians, schools, governments, Non-Governmental Organizations (NGOs) and informal communication destinations.

Talluri (2018) The current examination was intended to contemplate the degree of Social Maturity of Government and Private Secondary School Students.[3] The examination was led on an example of 576 optional school understudies concentrating in ninth class of Guntur area, Andhra Pradesh. For information assortment the agent has utilized Social Maturity scale built and normalized by Dr.Nalini Rao. The information gathered was exposed to measurable examination, for example, Mean, S.D. what's more, "t" values. The aftereffects of the examination demonstrated that there is no critical contrast in Social- development of auxiliary school understudies according to their sex and sort of the executives) studied the social maturity level of government and private secondary school students.

Arora & Sharma (2018) studied the social maturity of senior secondary school students in relation to their psychological well- being and emotional intelligence.The finish of the 20th century and start of the twenty first century[1]has seen on exceptional upsurge in exercises spinning around the teen pre-adulthood understudies. [1]It is the desperate need of great importance that as teen youth understudies, we ought to have legitimate enthusiastic advancement to appropriately utilize our human feelings. So, our human brain has something crucial to do with human feelings to get mingled. The investigation was led on 100 understudies, were chosen through straightforward arbitrary testing strategy from the Jalandhar city of Punjab state, India. The age scope of the example is 14 to 16 years. Social development scale created by Dr.Nalini Rao (1971), Psychological Well-Being Scale byDr.Devender Singh Sisodiaand Miss Pooja Choudhary (1971), Emotional insight

scale created by Dr.SarabjitKaurwere managed to the example. Information was breaking down utilizing mean, SD and 'two route examination of change. Results uncovered that Emotional Intelligence is needed to comprehend the idea of social world they live inside. There exists critical cooperation impact between mental prosperity and Emotional knowledge on the score of Social Maturity. High mental prosperity is fundamental for Social Commitment, Social Tolerance, and Openness to change. Passionate insight is significant for Work Orientation, Self-Direction, and Ability to take pressure, Communication, Enlightened Trust, Cooperation, Social Commitment, Social Tolerance, and Openness to Change. There is huge distinction in Personal sufficiency and social ampleness of Senior Secondary school understudies corresponding to Psychological Well-Being and Emotional Intelligence.

Sani et al., (2017) researched on surveying the Relationship between Addiction to Social Networks and Emotional Maturity in Students.Informal organizations give a climate to virtual correspondence and assume a key and truly filling part in nature of emotional wellness. Passionate development is a key compelling component of feelings control, conduct, and improvement of psychological wellness. [12] The current paper is pointed toward looking over the connection between dependence on informal communities and enthusiastic development of understudies. An enlightening logical investigation was conveyed with cooperation of 181 understudies in the Faculty of Medical.

Perloff (2014) conducted a study on social media effects on young women's body image concerns.[9]Despite the fact that there is a voluminous writing on broad communications consequences for self-perception worries of youthful grown-up ladies in the U.S., there has been moderately little hypothetically determined exploration on cycles and

impacts of online media on youthful ladies' self-perception and self-discernments. How-ever given the weighty online presence of youthful grown-ups, especially ladies, and their dependence via web-based media, it is critical to value ways that web-based media can impact view of self-perception and self-perception unsettling influence. Drawing on correspondence and social mental speculations, the current article expresses a progression of thoughts and a system to control research via web-based media consequences for self-perception worries of youthful grown-up ladies. The intuitive organization and substance highlights of web-based media, for example, the solid companion presence and trade of a huge number of visual pictures, recommend that web-based media, working by means of negative social examinations, transportation, and peer standardizing measures, can altogether impact self-perception concerns. A model is recommended that accentuates the effect of inclining singular weakness qualities, online media utilizes, and interceding mental cycles on body disappointment and dietary problems. Examination based thoughts regarding online media impacts on male self-perception, convergences with identity, and ameliorative procedures are moreover talked about.

Methodology

Aim

To investigate the mediating role of internet usage on Social Maturity of Young Adults

Objectives

·   To study the Social Maturity of Young Adult internet users.

·   To compare the Social Maturity of male and female young adult internet users

Hypothesis

There will be a significant difference in the levels of Social Maturity among males and females Young Adults internet users.

Sample

The sample comprised of 202 respondents with 106 females and 95 males. University and College going students were selected for this study. The Purposive cum incidental sampling technique was used.

Description of the tool:

Social Maturity Scale by Nalini Rao (1986)

This scale is for primary, secondary and pre-university grade students. It consists of 90 items, three dimensions and nine sub-dimensions in total.

They are as below:

1.   Personal adequacy-

·   Work orientation- manifest in the perception of work-related skills and development of proper attitude towards work in terms of knowledge of standards of competence in performing task, capacity for experiencing pleasure in work leading to self-sufficiency.

·   Self -direction- manifest in one's capacity to independently act and exercise control over one's action. This also involves the initiative an individual takes in directing himself and his actions with a feeling of security and full faith in one's effort.

·   Ability to take stress- is an ability to exhibit appropriate emotional stability and react without embarrassing either himself or the group he is in; it also involves ability to undertake challenging task with assurance.

2.   Interpersonal adequacy-

·   Communication- It involves an ability to

understand, write to communication and make clear meaningful speech and gesture. The ability also involves empathy which sensitizes the individual to the affective domain.

· Enlightened trust- includes general belief that is acceptable to rely or depend on others when need arises, it involves clear functioning of enlightened decision about whom, when and how much to trust.

· Cooperation- it is an altruistic tendency to join others in their efforts in order to reach a mutually desirable goal, it involves ability to regard rules and practises more as reciprocal social agreement rather than a rigid, unchangeable law.

3. Social adequacy-

· Social commitment-involves a feeling of oneness with others, willingness to modify or relinquish personal goals in the interest of societal goals and also a readiness to invest in long term social goals

· Social tolerance- involves a person's willingness to interact with individuals and groups, who differ from him, sensitivity to the rights of individual and groups who differ from him thus accepting the difference as a means of building up the out- group loyalties.

· Openness to change-involves willingness to accept changes in the social setting and adapt oneself to the demand of the changes.

Procedure

The information was gathered utilizing the scale of Social Maturity by Nalini Rao (1986). The participants rated their response on a four-point scale from Strongly Agree to Strongly Disagree along with some demographic information like age, gender and internet usage category which they fall into. This category was on the basis of researches done and the category was hence defined in the tabular format which is as follows: -

Internet used in a day	Category
Less than 1 hour	Low Internet Usage
1-2 hours	Average Internet Usage
3 hours & above	High Internet Usage

Results & Analysis

Table 1: The following table shows the percentage of internet usage by males and females.

Internet usage in a day	Percentage of Males	Percentage of Females
Less than 1 hour	45%	55%
1-2 hours	43%	57%
3 hours & above	39%	61%

On analysing the internet usage of males and females, percentage of females were found to be high in comparison to males and their social maturity was also found to be more in comparison to males
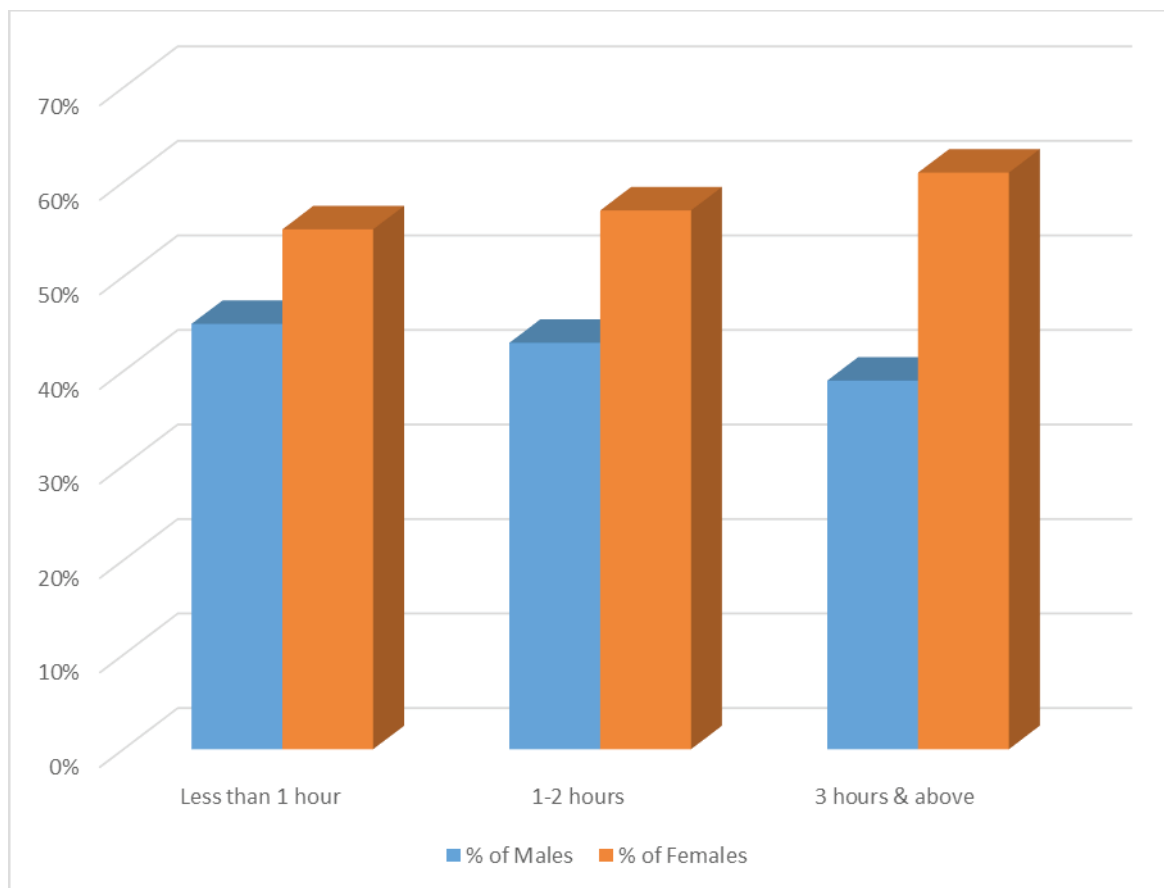
Graph 1: The following graph shows the percentage of male and female internet usage

Table 2:: The following table shows the mean and t score of three dimensionsof Social Maturity and overall Social Maturity among male and female young adult internet users.

Social Maturity subscales		Mean	t score
Social maturity	Female	72.41	0.504
	Male	27.64	
1.Personal adequacy	Female	71.58	-3.208
	Male	67.31	
2.Interpersonal adequacy	Female	71.12	-2.66
	Male	66.32	
3.Social adequacy	Female	69.51	-3.57
	Male	61.58	
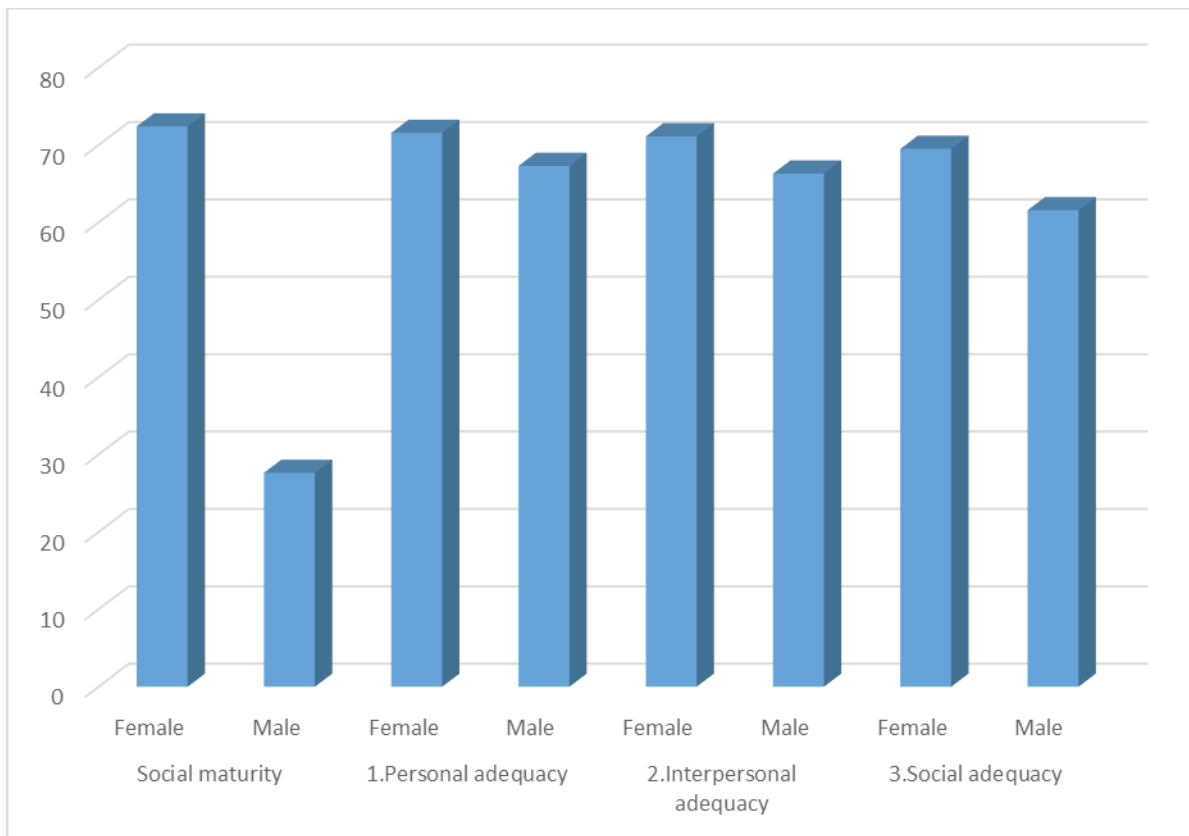
Graph 2: The following graph shows the mean of Social maturity and its dimensions among males and females.

Discussion

The aim of the study was to investigate the Social Maturity of Young Adult internet users and to compare the Social Maturity of males and females. Accordingly, hypothesis was formed that there will be a significant difference in the levels of Social Maturity among males and females Young Adults. This has been proven to be true as the overall social maturity were found to be high in females than males in spite of their high internet usage.

Though many researches have reported that high usage of internet leads to social blockage but this does not hold true in this context. It has also been reported that high internet usage establishes negative connection between web dependence and social capability. Itinfluences youthsa lot as their social fitness is high but physical fitness is on decline.All

may unarguably agree that internet has become avital part of each of our lives. With the swelling use of the Internet, especially among youth it is indispensable part of our daily routine. Researches haveanalysed the impact of psychological characteristics on individuals due to its increased use. Also, internetis being linked with depression and anxiety.

Ali et al., (2019) identified the role ofsocial networks on the personal and social life of people[6]. It plays significant role by making the ground in order to exchange a huge amount of information wherever required, Furtherpeople who are high on social networkingtheir social maturity was found to be high. As Social maturity also demonstrates age-appropriate behaviours in line with society's standards and expectations.

Similarly, Devi et al., (2018)[7]were of opinion that internet is primarily an outstanding innovation within the history of world. They wanted to assess the effect of Internet Use on Emotional Maturity and General Well Being among adolescence. The study results show that students of Perceived Impact of Internet Use on Emotional Maturity level had 56% high emotional maturity, 44% average emotional maturity and it also shows that 0.5% serious well-being, 26% Distress Well-being, 68% stress problem well-being,3% Marginal well-being, 2% low positive well-being & 0.5% positive well-being in General Well Being of students.

Summary and Conclusion

Thus Internet usageis a boon as well as bane. It does not always have an adverse effect on social and psychological aspects of one's wellbeing but also has positive effects. More research is needed to examine the generalizability of these findings, to identify mediating mechanisms other than Internet usage which influences the social maturity of young adults in order to develop and evaluate interventions.

Ethical Clearance: Not Applicable

Source of Funding: Self

Conflicts of Interest: Nil

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Profile of Serious and Non-Serious Adverse Effects Following Immunization (AEFI) of Measles Rubella Vaccine

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Abstract

Background: The measles rubella immunization campaign conducted in 2017 on the island of Java has replaced the previous measles immunization, and its administration is carried out at 9-12 months of age and 18 months of age. As a new vaccine, the administration of MR vaccine cannot be separated from AEFI.

Objective: We aimed to study the AEFI profile of MR vaccine administration by passive surveillance from the first campaign of MR vaccine in East Java Province.

Methods: Our study was a retrospective observational study (surveillance survey). The research was conducted from January - April 2021. Children who received the first dose of the MR vaccine in the MR campaign at all age were enrolled in the study. We divide the group of serious and non-serious AEFI. The sample were collected using randomized sampling method. A questionnaire was used to collect the demographic details of the children and the characteristic of the AEFI's symptoms.

Results: The total sample is 43 children with serious AEFI, consisted of 22 (51.2%) males and 21 (48.8%) females. The most common AEFI reported was fever (76.7%), followed by gastrointestinal symptoms (60%), local reactions (25%), respiratory tract symptoms (23.2%), central nervous system symptoms (11.6%), and rash (6.9%).

Conclusion: Fever is the most frequently reported symptom. Most of the AEFI symptoms didn't had causal relationship with MR vaccine. Thrombocytopenia is known to have a causal relationship as a reaction to the MR vaccine.

***Keywords*:** *AEFI; Measles; Rubella; MR vaccination*

Introduction

Measles, also known as morbili, is an acute infectious disease that affects the respiratory system, immune system, and skin. This infection is caused by the morbili virus – single-stranded RNA morbili virus – which belongs to the paramyxovirus group. While Rubella (German measles) is an infectious disease caused by togavirus, through the RNA chain. Measles has a high rate of morbidity and mortality. On the other hand, rubella has relatively mild symptoms, but is clinically significant when it occurs during pregnancy and puts children at risk for congenital rubella syndrome.[1,2] There is no specific treatment for measles nor rubella, but both can be prevented by vaccination. Since the discovery of the MMR vaccine (measles, mumps, rubella) in October

1988, the transmission of measles has decreased dramatically, and the incidence of measles is very low.[3] The measles mortality rate which decreased significantly after vaccination shows evidence that the coverage of measles vaccine is very important because it can reduce mortality and morbidity due to measles, especially in low-income countries. This disease is highly contagious in immunocompromised communities.[4]

Until mid-2017, Indonesia was still providing measles single immunization, but due to the increasing incidence of CRS in the last decade, the single measles vaccination was replaced with the MR combination vaccine. MR immunization campaign is carried out with the aim of achieving measles elimination and CRS control in 2020. The target of MR immunization is all Indonesian children aged 9 months to <15 years. During the campaign period, MR immunization was given regardless of immunization status or previous history of measles and rubella. Then the MR immunization will be included in the routine immunization schedule given at the age of 9 months, 18 months, and in first grade of elementary school.[5]

Along with the higher immunization coverage, the use of vaccines also increases, the unwanted reactions after immunization also increase. WHO has defined adverse effect following immunization (AEFI) as an unwanted medical event that follows immunization and does not necessarily have a causal relationship with vaccine use. Based on the symptoms, AEFIs are broadly classified into three categories: common minor AEFI, which includes fever, rash, and local reactions; Serious AEFI, which results in hospitalization, life threatening, death, or significant disability; and severe AEFI, which includes any adverse event of increased severity.[6]

The MR vaccine used in the immunization campaign program is a live-attenuated vaccine containing the Edmonston-B strain of measles and the RA 27/3 strain of rubella. The administration of the Edmonston B vaccine was associated with a high rate of fever (temperature of 39.4°C or higher in 20% to 40% of vaccinees) and rash (approximately 50%), but the general condition remained well.[7] A study conducted in India about AEFI in MR vaccines reported that the most common symptoms was fever (38%), followed by upper respiratory tract infection (30.9%), local swelling at injection site (26.1%), and skin rash (4%).[8]

Reported AEFI following the use of combined vaccines (MR and MMR) are similar to those described with single antigens. The type and rate of serious adverse events does not differ significantly for MMR or MR combinations compared with the individual antigens. The MR vaccine is highly safe and well tolerated.[9]

AEFI reporting in Indonesia is a passive reporting process. As only a few Indonesian studies on adverse reactions of vaccines could be traced, we wished to collect bigger data on AEFI in pediatric population of Indonesia through the present study

Materials and Methods

We did a retrospective observational study, with cross-sectional design, among the children whom attended the MR vaccination campaign in year 2017 in Blitar region, East Java province, Indonesia. The research was conducted from January - April 2021. The sample size was calculated using formula for estimating population proportion, with the minimum sample size was 42. Primer data were collected from data in East Java provincial health office. Furthermore, we did passive surveillance to the Blitar region among them who had experienced AEFI. The children who had experienced AEFI was divided into two groups – serious AEFI (group 1) and non-serious AEFI (group 2).

The parents of two groups were given questionnaire to fill out regarding the child's basic data, the MR immunization procedure that had been carried out, and the symptoms of AEFI. The local reaction consists of pain, swelling and reddish at the injection site. We also examined other systemic reaction such as fever, rash, and organ system involvement. The exclusion criteria for this study were if the parents were not willing to fill out the questionnaire or the parents were not present. Confidentiality of the data collected was ensured. Data was entered in a Microsoft Excel sheet and subsequently analyzed in an Excel sheet.

Results

A total of 50 children had experienced serious AEFI, but among them there were 5 parents/guardians who were not present at the time of the survey, and 2 parents who refused to fill out the questionnaire.So there were 43 children in group 1. Meanwhile there were 100 children in group 2. Out of the 143 children for whom survey could be completed, consisted of 21 boys (51.2%) and 20 girls (48.2%) in group 1, while in the group 2 there were 49 boys (49%) and 51 girls (51%).Ages 1 – 5 years are the largest group who had experienced AEFI MR in both groups. There were 16 (37.2%) and 18 (18%) children with poor nutrition in group 1 and group 2. History of allergy present in 8 (18.6%) and 4 (4%) children, respectively in both groups. More of the basic characteristic of research subjects are presented in Table 1.

Based from the onset of symptoms, 199 (87.6%) symptoms appeared in the initial 7 days and 28 (12.33%) symptoms appeared more than 7 days after vaccination (Table 2). Of the AEFI's recorded, the most common was fever (74.1%), followed by gastrointestinal symptoms (36.3%), local reactions (19.6%), respiratory tract symptoms (17.4%), central nervous system symptoms (8.4%), and rash (2.79%). Eighty- three children experienced more than one AEFI. The most common combination was fever and gastrointestinal symptoms (n=52).

Table 1. Basic characteristic of research subject

Characteristics	Group 1 (serious AEFI, n=43)	Group 2 (non-serious AEFI, n=100)
Sex:		
- Male	22 (51.2%)	49 (49%)
- Female	21 (48.8%)	51 (51%)
Age:		
- < 1 year	2 (4.6%)	0
- 1 – 5 years	38 (88.4%)	72 (72%)
- > 5 years	3 (7%)	28 (28%)
Nutritional status:		
- Good nutritional status	27 (62.8%)	82 (82%)
- Poor nutritional status	16 (37.2%)	18 (18%)
History of allergies:		
- Present	8 (18.6%)	4 (4%)
- Not present	35 81.4%)	96 (96%)
Parents education level:		
- Low	15 (34.9%)	1 (1%)
- Medium	22 (51.1%)	90 (90%)
- High	6 (14%)	9 (9%)
Parents knowledge about immunization		
- Good	35 (81.4%)	97 (97%)
- Poor	8 (18.6%)	3 (3%)

Table 2. Symptoms and onset of adverse effect following immunization

AEFI reported	Number of AEFI		Total (n)
	Within 7 days after vaccination	More than 7 days after vaccination	
Local reactions (Pain, Swelling, Reddish)	28	-	28 (19.6%)
Fever	95	11	106 (74.1%)
Rash	2	2	4 (2.79%)
Respiratory tract symptoms (cough, runny nose, dyspnea)	22	3	25 (17.4%)
Central nervous symptoms (seizure, encephalopathy)	10	2	12 (8.4%)
Gastrointestinal symptoms (nausea-vomiting, diarrhea)	42	10	26 (36.3%)
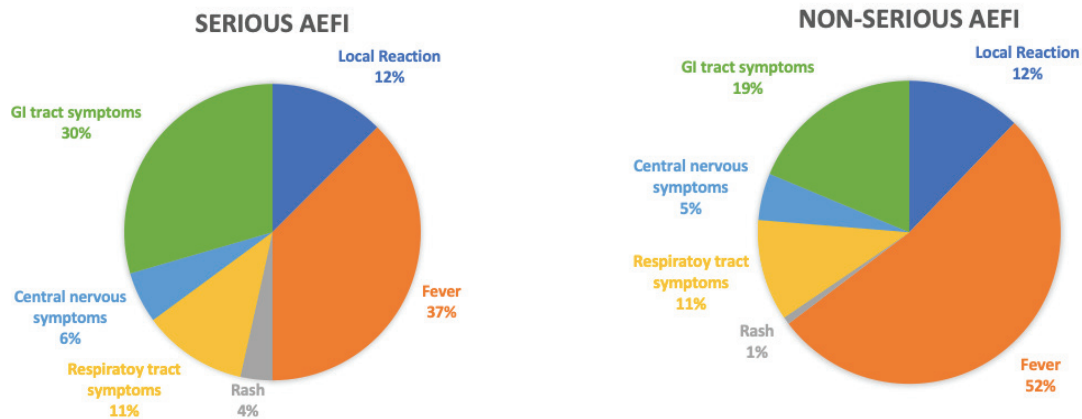
Figure 1. Symptoms of AEFI in both groups

Fever dominated the symptoms of AEFI in both groups, but in group 2 the proportion is bigger (Fig.1). Rash symptoms occur in 4% of serious AEFIs and 1% of non-serious AEFIs. The other symptoms relatively no difference in both groups.

Discussion

The incidence of serious and non-serious AEFIs during the 2017 MR campaign period in Blitar district was 502 children out of a total of 256,138 immunization coverage (0.19%), consisting of 50 serious AEFI cases and 452 non-serious AEFI cases,

and there was 1 report of death. Not many study centers have reported AEFIs using the MR. A study in India [8] reported AEFI of MR in 9-12 months children as many 42 out of 271 children, but the study still cannot describe the AEFI of MR in population. Meng et al [10] reported AEFI of MMR in Anhui province in China as many as 1893 children out of 9.9 million dose of vaccine (0.019%). Meanwhile in selected province in Iran, Esteghamati et al [11] reported 792 cases out of 43447 of AEFI in MMR vaccination.

In this study, all subjects in group 1 were hospitalized, with fever became the most common symptoms. Fever is the most frequently reported symptom of AEFI in various study centers. [8,11–13] Vaccine Adverse Effects Reporting system (VAERS) in the USA reports that the incidence of fever can be found in the serious and non-serious AEFI groups. Experts who are members of VAERS found several explanations for the occurrence of this fever. Fever may just be one of many signs and symptoms that are actually coincidental at the same time, for example a fever associated with sore throat and cough after immunization is much more likely to be caused by the common cold than a vaccine. The lack of data also makes it impossible to infer the level or relative risk of fever after immunization, compared with the unvaccinated population.[14] Children experience an average of 2-6 episodes of acute fever in the first 2 years of life, with two-thirds of cases requiring medical treatment, so the assessment of fever as an AEFI must take into account the background factors of the disease, and the infectious process that occurs at the time of immunization the most common cause of fever. [15,16] Poland et al [17] defined that fever reported as AEFI is a manifestation of acute viral infection and trauma due to injection that causes an immune reaction and causes the release of cytokines in the body.

Other symptoms involving organ systems have been tested for causality by AEFI's regional commission in East Java province and none of them meet the causal relationship as AEFI MR. Systemic reactions that have been proven as AEFI vaccines containing measles are febrile seizures, thrombocytopenia, and anaphylactic reactions.[6]This study found 2 cases of AEFI that had a consistent causal relationship as a reaction to the MR vaccine, which is thrombocytopenia, that manifested as ITP. The risk of ITP after MMR immunization was investigated by France et al [18] who found 259 cases of ITP in 1,036,689 children who received MMR vaccine (0.02%). The greatest incidence of ITP occurs in children aged 12-23 months and 76% of cases have been shown to be consistent with MMR AEFI reactions with the number of cases being 1 per 40,000 doses of vaccine. ITP in children over the age of 5 years was only found in 5 out of 259 cases. A systematic review of 12 studies found the incidence of ITP as an MMR AEFI of 0.087 – 4 cases per 100,000 doses of vaccine. ITP as a vaccine reaction is very rare, and is generally not life threatening and self-limited.[19]

Conclusion

Among all AEFI reports, fever is the most frequently reported symptom. Most of the AEFI symptoms that had been reported didn't had causal relationship with MR vaccine. Thrombocytopenia is known to have a causal relationship as a reaction to the MR vaccine.

of this article.

Ethical Clearance: The ethical clearance was approved by the Health Research Ethics Committee Faculty of Medicine, Airlangga University (No. 283/EC/KEPK/FKUA/2020).

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A Community based Cross-Sectional Study of the Morbidity Status of Geriatric Population in an Urban Slum

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Abstract

Introduction: Aging is a physiological phenomenon which nobody can escape. Population around the world is growing old at high rate with increasing life expectancy. The challenge ahead for health care in coming years is to ensure the quality of life to a large group of geriatric population. **Aims**: To study the socio-demographic factors of the geriatric population, to assess the morbidity status among geriatric population and to determine the association of socio-demographic factors with the health status of geriatric age group. **Methods:** A cross-sectional study was conducted among persons with age 60 years and above in an urban slum of Mumbai from June 2017 to June 2018.Sample size was calculated based on the prevalence rate of general morbidity of geriatric population which is 52%. Sample size of 370 obtained. **Result:** Most of the study population had present illness (88.4%). Joint pain (62.93%), ocular problems (61.9%), anemia (50.3%), were the most common type of morbidity amongst study population followed by urinary, diarrhoea was (11.6% each) constipation, Breathlessness (11.4% each) and cough (10%). There was statistically significant difference between Joint Pain and gender (p =0.000), Ocular Manifestations (p= 0.000), Anemia and gender (p= 0.000). Hypertension was present in (50.3%) amongst study population. Knee was (31.6%) the most common site of joint pain amongst study population followed by hip pain (19.7 %) and ankle pain (11.6%). **Conclusion:** This study provides a baseline to help local authorities for understanding morbidity patterns of geriatric population.

Keywords: *Geriatric, Morbidity, Prevalence, Urban slum.*

Introduction

As per WHO, 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. This fact holds equally true for neonatal to geriatric population. Aging happens to everything, living and non-living in the universe. It is a physiological phenomenon which nobody can escape .The most common opinion among general population is that aging stresses people due to loss of independence and dependence on family members and onset of disabilities or diseases.The term "GERIATRICS" is derived from the Greek word *"Geron"* which means 'old man' and *"iatros"* which means 'healer' .The term geriatrics was coined by Nascher. In simple words, Geriatrics is the care of the aged people.[1] Geriatrics is a specialty of medicine which focuses on old age .It promotes health by preventing and treating disease and disabilities in elderly people. The study of physical and psychological changes which are incident to old age is called Gerontology i.e. the study of aging process.[2] World Health Organization (WHO) defines old age as "at and above 60 years". According to

2011 census, 60 years and above people are 8.2 % of total population,70 years and above are 3.1 % of total population and 80 years and above are 0.7 % of total population. Population around the world is growing old at high rate with increasing life expectancy. The challenge ahead for health care in coming years is to ensure the quality of life to a large group of geriatric population. However, to address the health care needs of this growing numbers of vulnerable heterogeneous population, reliable information about their health problems from different social settings still lacking in India. Therefore this study was attempted to assess the morbidity status of the geriatric population in an urban slum.

Objectives:

1. To study the socio-demographic factors of the geriatric population.

2. To assess the morbidity status among geriatric population

3. To determine the association of socio-demographic factors with the health status of geriatric age group.

Materials and Methods

Field practice area attached to the Urban Health Centre under the administration of the department of Community Medicine of the parent medical college. The study was conducted in an urban slum. Total population of study area is 84,783. (Census 2011). This slum consists of 50 plots (1 to 42, 43, 43A, 44 to 49).Each plot is divided into two parts. Each part has 10 lines, these lines are numbered from A to K (except I) on left side and from L to U on right side. Each line has 9 houses numbered from 1to 9.Total 180 houses are there in each plot. So, total 9000 houses are there in 50 Sample size: 370 plots. Study population comprising of persons with age 60 years and above. A Community Based Cross-sectional

Descriptive Epidemiological Study. The data was collected from June 2017 to June 2018.The size of the sample calculated based on the prevalence rate of general morbidity of geriatric population which is 52% as reported in NSSO (National Sample Survey Organization) . The formula used to calculate the sample size is given below: According to the formula $n=4pq/L^2$

n=sample size, p=prevalence rate q=100-prevalence rate (100-p) L=allowable error taken as 10% Therefore $n=4pq/l^2$ n = (4X52*(100-52)/5.2*5.2=369.66=370.Further sampling was done by systematic random sampling method. Sample size of 370 divided among the 50 plots, every first house was selected by simple random sampling in each plot and after that with the help of Systematic Random Sampling Method every 22nd house was considered for the study till the sample size of 8 is met from each plot. If any house found locked or inclusion criteria not fulfilled then next house was targeted. And as soon as the target of 8 samples from 1 plot is accomplished other plot was targeted.

Geriatric Depression Scale Score (GDS-S) was used[3,4]:

It is 15 item questionnaire that can be completed in writing or during an interview. It is a screening instrument for depression which should be used primarily to rule out depression, which needs to be further evaluated if depressive. The GDS-S should be given orally. A clear YES or NO answer is required for each question. Depressive answers (errors) are circled on the form and are bolded below. The final score is the tally of the number of depressive answers with the following scores indicating depression.

GDS Maximum Score: 15

0 – 4 Normal, depending on age, education and complaints.

5 – 8 – Mild Depression

8 – 11–Moderate Depression

12 – 15 – Severe Depression

If a patient does not answer a few items, for eg., if

3 of 15 items are not answered then the, total score is score on 12 completed PLUS 3/15^{ths} of total score to make-up for omitted items.

In case the patient is aphasic, a point-board, or a board with the scale is used and yes/no is written next to the items and the patient points out correct answer.

No.	Question	Answer	Score
1.	Are you basically satisfied with your life?	YES / **NO**	
2.	Have you dropped many of your activities and interests?	**YES** / NO	
3.	Do you feel that your life is empty?	**YES** / NO	
4.	Do you often get bored?	**YES** / NO	
5.	Are you in good spirits most of the time?	YES / **NO**	
6.	Are you afraid that something bad is going to happen to you?	**YES** / NO	
7.	Do you feel happy most of the time?	YES / **NO**	
8.	Do you often feel helpless?	**YES** / NO	
9.	Do you prefer to stay at home, rather than going out and doing new things?	**YES** / NO	
10.	Do you feel you have more problems with memory than most people?	**YES** / NO	
11.	Do you think it is wonderful to be alive?	YES / **NO**	
12.	Do you feel pretty worthless the way you are now?	**YES** / NO	
13.	Do you feel full of energy?	YES / **NO**	
14.	Do you feel that your situation is hopeless?	**YES** / NO	
15.	Do you think that most people are better off than you are?	**YES** / NO	
		TOTAL	

(Sheikh & Yesavage, 1986)

Results and Discussion

The study population had present illness in (88.4%). (Table 1)

Joint pain (62.93%) , ocular problems (61.9%), anaemia (50.3%), were the common type of morbidity amongst study population followed by urinary , diarrhoea was (11.6% each) constipation ,Breathlessness (11.4% each) and cough (10%). (Table 2)

Present illness was present in 42.5 % of female population and 57.5 % of male population and this difference was statistically not significant. In female population most of the subjects had joint pain (92.30%) , anemia (85.23%) , ocular complaints (44.23%), (breathlessness (13.5%) followed by diarrhoea (12.2%) and hard of hearing (11.5%) while in male population most of the subjects had ocular complaints (74.76%), joint pain (36.91%) , anemia (24.77%), constipation (12.6%) followed by urinary problems (12.1%) and Diarrhoea (11.2%) (Fig 1). There was

statistically significant association between Joint Pain and gender (p =0.000) (Fig 2), Ocular Manifestations (p= 0.000), Anemia and gender (p= 0.000)(Table 5) In both female and male population, Hypertension (44.88 % vs 54.21%) was the most common Present Medical illness followed by (DM+HTN (27.6 % vs 29 %), DM (21.2% vs 22%) and Hearing impairment (15.4% vs 18.7%)(Fig 3) . There was no statistically significant difference between Present Medical illness and gender. In both female and male population knee pain (34 % vs 29 .9%).was the most common site of joint pain followed by hip pain (19.2% vs 20.1%) and ankle pain(10.9% vs 12.1%) . There was no statistically significant difference between site of joint pain and gender. Hospitalization in last one Year was present in 46.8 % of female population and 53.2 % of male population and this difference was statistically not significant. In both female and male population Severe GDS score (32.7 % vs 32.2%).was the most common GDS score followed by moderate GDS score (30.1% vs 26.6%).(Fig 4)There was no statistically significant difference between GDS score and gender. (Table 3)

Over the past decades, India's health programme and policies have been focusing on issues like population stabilization, maternal and child health and disease control. However, current statistics for the elderly in India gives a prelude to a new set of medical, social and economic problems that could arise if a timely initiative in this direction is not taken by the program managers and policy makers. There is a need to highlight the medical and socioeconomic problems that are being faced by the elderly people in India, and strategies for bringing about an improvement in their quality of life.

In the present study, 66 to 70 years (60 %) was the most common age group amongst study population followed by more than 70 years (28.1%) and 60 to 65 years (11.9%). This findings is in agreement with study conducted by Goel PR, et al.[5] Similarly Lena A et al [6] reported that around 73% of study population belonged to 60-69 years of age group. Surekha Kishore et al [7] observed that majority of the study subjects belonged to age group of 60-64 years (40.7%).

In the present study, female contributes 42.2 % of study population while male contributes 57.8 %. This findings is in agreement with the study conducted by P. Sengupta et al.,[8] Similar findings were reported by Goel PK et al.[5] Similarly in the study conducted by Chacko & Joseph et al.[9,] , there was 52.3 % of female and 47.7 % of male respectively.

The study population were married (86.2%) followed by Widow (6.8%) and Divorced (5.4%) This findings is in agreement with the study conducted by P. Sengupta et al .[8]

In our study, most of the study population were living in joint family (67 %) followed by nuclear family (32.2 %) and single (0.8%). Lena A et al[6] observed that joint family system was seen to be in (56.8%) and followed by nuclear family.

In our study, most of the study population were belonged to V status (32.4 %) followed by IV (30.5%) and II (16.5 %). This is in accordance to study conducted by Rahul Prakash et al .[10]

In our study (13.8 %) population was doing skilled type of work followed by semiskilled (9.2%) and unskilled (1.9 %) , in the study conducted by Lena, et al[4] approximately 18.7% were still working as unskilled workers .Similar results were seen in a study by Elango[11] and Singh et al.[12]

In our study, (59.7 %) population were illiterate followed by secondary education (15.1%) and primary education (11.4 %) This findings is in agreement with the study conducted by Lena et al[6] , Padda, et al.[13], Elango [11] and Singh, et al.[12]

In this study, Hypertension (50.3%) as present medical illness amongst study population followed by DM+HTN (28.4%) , DM (21.6%) and Hearing impairment (17.3%)According to the study by Ingle et. Al [14] in rural area of pondichery showed Diabetes Mellitus (8%) and Hypertension (14%) A study by Lena et. Al[6] ,Dharmviret. Al [15] and Chandwaninet. al. [16,] Diabetes Mellitus and Hypertension was found as a leading problem which was similar to this study

In this study, 61.9% of study population had Ocular complaints. Similarly in the study conducted by Prakash, Choudhary& Singh [17] and Purohit and Sharma [18], in which cataract was reported in 40 percent of the elderly. Anil Jacob [19] reported that reduced visual acuity due to cataract was 32.1% of the subjects.

In our study, urinary, diarrhea was (11.6% each), constipation, Breathlessness (11.4% each) and cough (10%) were symptoms amongst study population

In the present study, in female population most of the subjects had breathlessness (13.5%) followed by Diarrhoea (12.2%) and Hard of hearing (11.5%) while in male population most of the subjects had constipation (12.6%) followed by urinary problems (12.1%) and Diarrhoea (11.2%) Surekha et al [7] reported that 12.3% of subjects had GIT problems, Rahul Prakash et al [10] reported that 4.7% of subjects had GIT problems, which were similar to the present study. Bhatia SPS [20] , Swami HM et al [21] reported the similar findings.

Of all gastrointestinal disorders, constipation (11.4%) was reported. Other studies [22] have reported similar findings.

In this study, knee was (31.6%) the most common site of joint pain amongst study population followed by hip pain (19.7 %) and ankle pain (11.6%)Anil Jacob and Purty et al [17] observed joint pain in 43.2%. Swami HM et al[21] reported joint pain was in 38.5% of study population. Cough was present in 10.8% of elderly and nasal congestion (cold) was found in 4.1% of study population. Rahul Prakash et al [10] reported that 12.7% of study population was suffering with coryza.

In our study, (75%) of the respondents showed signs of depression, of which severe depression was observed in 32.4 per cent, moderate depression in 28.1%. The women were more prone to depression, with 32.7 per cent score of severe depression as compared to 32.2 per cent in males, and this was found to be statistically insignificant. This findings is in agreement with the study conducted by P. Sengupta et al. [8], Other study [23] also corroborate greater prevalence of depression in women compared to men.

Suggestions: The authors emphasize repeating the present study in other target groups of a another area. **Limitations:** The results of the study cannot be generalized as they are not representative of general population, as their social and economic factors are different.

Table no 1. Present illness amongst study population

Present illness	Frequency	Percentage (%)
No	43	11.6
Yes	327	88.4
Total	370	100.0

Table no 2. Morbidity amongst study population

Morbidity	Frequency	Percentage(%)
Joint Pain	233	62.93
Ocular	229	61.9
Anemia	186	50.3
Backache	32	8.6
Breathlessness	42	11.4
Constipation	42	11.4
Cough	37	10.0
Diarrhoea	43	11.6
Hard of hearing	36	9.7
Indigestion	32	8.6
Urinary	43	11.6

Table 3: Association of Morbidity with Gender

Variables	Total (n=370)	Sex		χ^2 Value	Df	P- Value	Significance (S*/NS#)
		Female (n1=156)	Male (n2=214)				
Present Illness	327(88.4%)	139(89.1%)	188(87.9%)	0.138	1	0.711	NS
Symptoms							
Joint Pain	223(60.3%)	144(92.3%)	79(36.9%)	115.614	1	0.000	S
Ocular	229(61.9%)	69(44.2%)	160(74.8%)	35.670	1	0.000	S
Anemia	186(50.3%)	133(85.3%)	53(24.8%)	132.062	1	0.000	S
Backache	32(8.6%)	12(7.7%)	20(9.3%)	0.312	1	0.576	NS
Breathlessness	42(11.4%)	21(13.5%)	21(9.8%)	1.194	1	0.275	NS
Constipation	42(11.4%)	15(9.6%)	27(12.6%)	0.808	1	0.369	NS
Cough	37(10.0%)	14(9.0%)	23(10.7%)	0.315	1	0.574	NS
Diarrhea	43(11.6%)	19(12.2%)	24(11.2%)	0.082	1	0.775	NS
Hard of Hearing	36(9.7%)	18(11.5%)	18(8.4%)	1.005	1	0.316	NS
Indigestion	32(8.6%)	12(7.7%)	20(9.3%)	0.312	1	0.576	NS

***Cont...* Table 3: Association of Morbidity with Gender**

Present Medical Illness							
BA	36(9.7%)	18(11.5%)	18(8.4%)	1.005	1	0.316	NS
DM	80(21.6%)	33(21.2%)	47(22.0%)	0.035	1	0.852	NS
DM+HTN	105(28.4%)	43(27.6)	62(29.0%)	0.088	1	0.767	NS
Hearing Impairment	64(17.3%)	24(15.4%)	40(18.7%)	0.690	1	0.406	NS
Hypertension	186(50.3%)	70(44.9%)	116(54.2%)	3.144	1	0.076	NS
Joint Pain							
Ankle	43(11.6%)	17(10.9%)	26(12.1%)	0.721	3	0.868	NS
Hip	73(19.7%)	30(19.2%)	43(20.1%)				
Knee	117(31.6%)	53(34.0%)	64(29.9%)				
Normal	137(37.0%)	56(35.9%	81(37.9%)				
Any Hospitalization in last one Year	141(38.1%)	66(42.3%)	75(35.0%)	2.017	1	0.156	NS
GDS Score							
Normal	98(26.5%)	40(25.6%)	58(27.1%)	0.898	3	0.827	NS
Mild	48(13.0%)	18(11.5%)	30(14.0%)				
Moderate	104(28.1%)	47(30.1%)	57(26.6%)				
Severe	120(32.4%)	51(32.7%)	69(32.2%)				
*S=Significant Association between two variables, #NS= No Association between two variables							
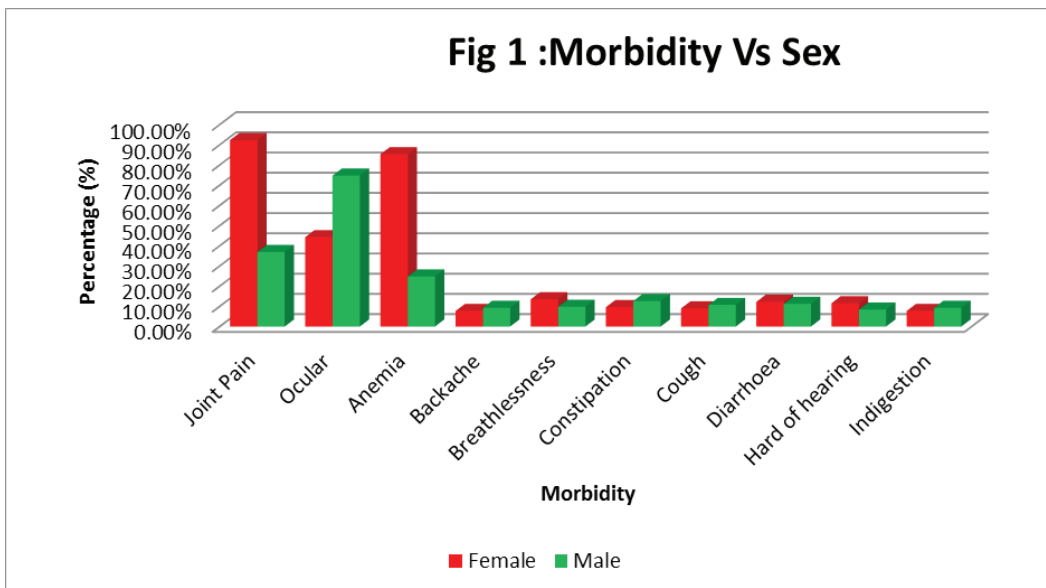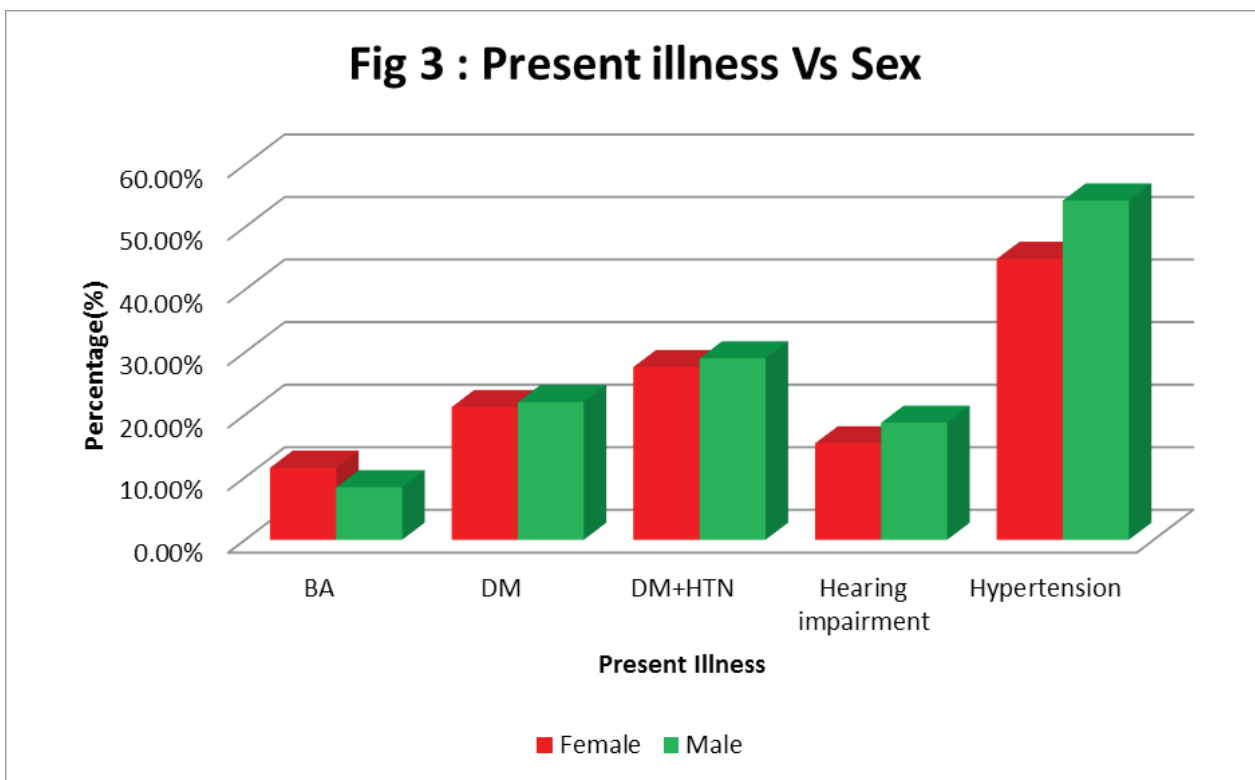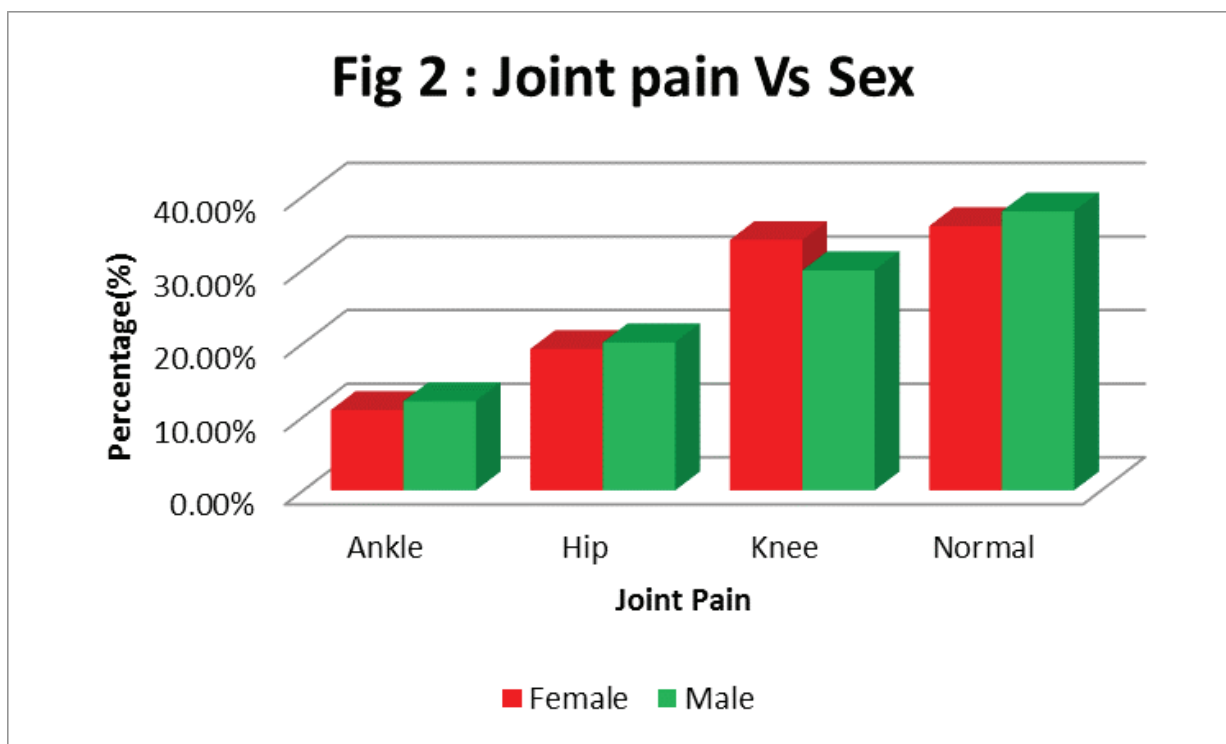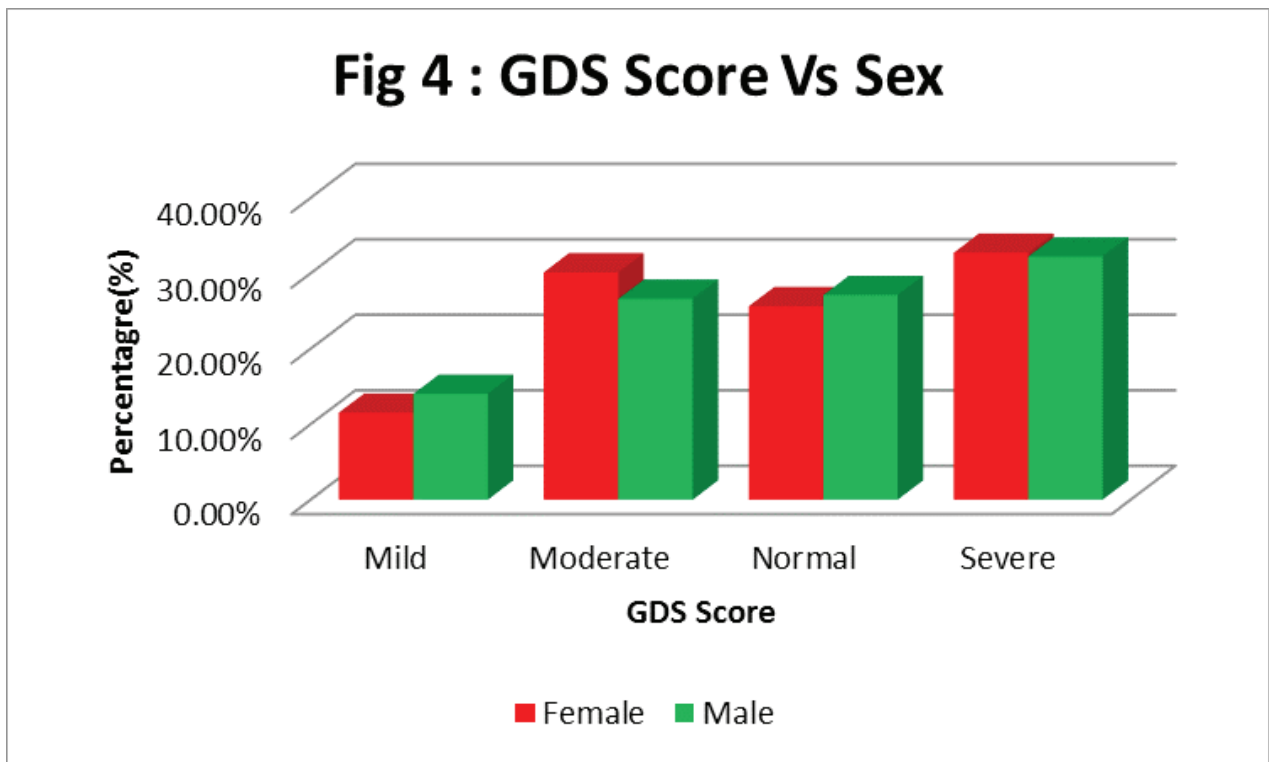
Fig 2 : Joint pain Vs Sex

Fig 3 : Present illness Vs Sex

Fig 4 : GDS Score Vs Sex

Conclusion

This study provides a baseline to help local authorities for understanding morbidity patterns of geriatric population and will contribute to application of appropriate intervention strategies.

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Conflict of Interest: No conflict has been reported by authors.

Ethical Permissions: For This Research ethical Permission was taken from Institutional ethical Committee. Ethics Committee of Topiwala National Medical College and B.Y.L Nair Hospital and Approval letter of Ethics Obtained.

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Prevalence of Anaemia at a Tertiary Care Center in India

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Abstract

Background: Anaemia is an important health indicatorfound common inallagesdue to deficiency of iron, acute and chronic blood loss, parasitic infections affecting Red BloodCells production andsurvival which may cause anaemia.

Method: Study was conducted on 71309 anaemicpatientsat Bhaktivedanta hospital and Research Institute,Thane Maharashtra India. Hemoglobin and packed cell volume values were analyzed based on gender , age groups (20-40 years,40-60 yearsand 60-80 years) .

Result:one third of men and two third of women in the given study population were seen to be anaemic of variable disease.

Conclusion: Prevalence and extent of anaemia irrespective of the etiology affects disease outcome in all acute and chronic conditions, whether it is surgical wound healing, heart failure, diabetic foot ulcers etc.

Adequate medical and dietary management of anaemia should be conjoint approach in any disease management strategy by the healthcare professionals along with the presenting medical surgical condition. Study also highlights the need of attention towards anaemia in male as well.

Keywords: *Anaemia, Male Anaemia, Female anaemia, prevalence of anemia, Hemoglobin concentration, Packed Cell Volume, severity of anaemia.*

Introduction

Anaemia is one of the most common concerns of global healthcare that is also a very common condition in India. Anemia is an abnormal physical and hematological condition that is associated with a lack of oxygen carrying capacity of the RBC and subsequent reduced oxygenation of the peripheral tissues.[1]

Iron deficiency is the primary cause and the contribution of B12 deficiency is the major cause of anaemia followed by folate deficiency. The presence of other micro nutrient deficiencies,including vitamins A, riboflavin, copper and zinc can increase the risk of anaemia. Other causes of anemia, excessive blood loss as a result of menstruation, or parasiticinfectionscan

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lower blood hemoglobin (Hb) concentrations.[2]The objective of this study is to determine the prevalence of anemia in men and women.

Material & Methods

Study Design and population

This is a cross-sectional, retrospective study carried out from December 2018to December 2020at Bhaktivedanta Hospital and Research Institute, Thane, Maharashtra India. Bhaktivedanta The study was initiated after obtaining approval from the Institutional Ethics Committee and approval from the Ministry of Health (EC/NEW/INST/2019/245)

Eligibility Criteria

Inclusion Criteria included age group of 20 years to 80 years , both gender , having haemoglobin level below 13 g/dl and packed call volume below 39 % . Patients below 20 years were excluded from the study.

Procedures

This retrospective study was conducted onpathology laboratory finding dataof complete blood count (CBC) for71309 anaemic patients aged between 20-80 years of both gender. Hemoglobin and packed cell volume values for these patients, of Bhaktivedanta Hospital and research Institute Thane, Maharashtra India, were evaluated.

Hemoglobin determination procedure recommended by the International Committee for Standardization of Hematology was followed as per the supervision of the Iron Reference Center.[3]The

WorldHealthOrganization uses Haemoglobin (Hb) threshold for the diagnosis of anemia. The prevalence of anaemia was grouped by age and gender.[4]

The anemia was definedin men (15 years of age and above) when Hb levels13.0g/dl or higher reflecting normal condition, 11-12.9 g/dl reflecting mild anaemia, and 8-10.9 g/dl reflectingmoderate anaemia, andlower than 8g/dl reflecting severe anaemia.The anemia was defined in women (15 years of age and above) when Hb levels 12.0g/dl or higher reflecting normal condition, 11-11.9 g/dl reflecting mild anaemia, and 8-10.9 g/dl reflectingmoderate anaemia, and lower than 8 g/dl reflecting severe anaemia.[5,6,7]

The anaemia was defined in men (15 years of age and above) when packed cell volume (PCV) levels 39.0% or higher reflecting non-anaemia, 33-38.7% reflecting mild anaemia, 24-32.7% reflectingmoderate anaemia, andlower than 24% reflecting severe anaemia.[8]The anaemia was defined in women (15 years of age and above) when packed cell volume (PCV) levels 36.0% or higher reflecting non-anaemia, 33-35.7% reflecting mild anaemia, and 24-32.7% reflectingmoderate anaemia, and lower than 24 % reflecting severe anaemia. The WHO recommended hemoglobin values that could be consideredanemia in which the hemoglobin level is lower than the figures given below. The values given are in g/dl. The packed Cell Volume values related to the concentration of hemoglobin given above can be obtained by multiplication. The value of PCV is three times higher than the value of hemoglobin.[9] (Table-1)

Table 1: Haemoglobin (g/dl) standard reference & Packed Cell Volume (%) Levels used to Diagnose Anaemia

Age group Prevalence		Anaemia							
		Non-Anaemia		Mild		Moderate		Severe	
		Men	women	Men	Women	Men	Women	Men	Women
15 years of age and above	Hb (Range)	13 or higher 13.0	12 or higher 12.0	11-12.9	11-11.9	8-10.9	8-10.9	lower than 8	lower than 8
15 years of age and above	PCV (Range)	39.0 or higher	36.0 or higher	33-38.7	33-35.7	24-32.7	24-32.7	lower than 24	lower than 24

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciencesversion22.0.We analyzed age standardized prevalence using sampling for men and women and additionally age distribution of the Indian Population.

Role of funding source

The funder of the study had no role in the study design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

The main purpose of our study was to identify the prevalence of anaemia in male and female. Study also aimed to evaluate anaemia as per age groups.A total71309 anaemic patients aged group of 20-80 years were studied for the prevalence of anaemia, of which 24931 (35%) were men and 46378 (65%) were women for whom f haemoglobin and packed cell volume were analyzed.

Our present study estimatedseverity of anaemia based on Haemoglobinlevel and PCV measurements as depicted in table 2 and figure 2.

Table 2: Distribution of severity of anaemia, by gender and age group

Population	Anaemia					
	Mild		Moderate		Severe	
	Men	Women	Men	Women	Men	Women
Hb Level	11-12.9	11-11.9	8-10.9	8-10.9	< 8	< 8
Age (20-40 Yrs)	2306 (69%)	7973 (71%)	888(26%)	2938 (26%)	155 (5%)	396 (3%)
Age (40-60 Yrs)	3650 (62%)	10241 (66%)	1866 (32%)	4617 (30%)	369 (6%)	601 (4%)
Age (60-80 Yrs)	8088 (62%)	9616 (63%)	4311 (33%)	4999 (32%)	625 (5%)	708 (5%)
PCV level	33-38.7	33-35.7	24-32.7	24-32.7	< 24	< 24
Age (20-40 Yrs)	135 (44%)	470 (53%)	156 (50%)	372 (42%)	18 (6%)	46 (5%)
Age (40-60 Yrs)	494 (51%)	780 (52%	428 (44%)	625 (42%)	51 (5%)	89 (6%)
Age (60-80 Yrs)	640 (46%)	845 (44%)	706 (51%)	983 (52%)	45 (3%)	79 (4%)

Present study estimated prevalence of anaemia by PCV concentration inmen and women (20–40 years) were 309 (12%) and 888(21%). Men and women (40-60 years) were 973 (36%) and 1494 (35%). Men and Women (60-80years) were 1391 (52%) and 1907 (44%).

We estimated prevalence of anaemia through Haemoglobin (Hb) measurements in Men andWomen(20-40 years) were 3349 (15%) and 11307 (27%). Men and women (40-60 years) were 5885 (26%) and 15459 (37%). Men and women (60-80 years) were 13024 (59%) and 15323 (36%). (Figure 1)

Figure 1: Prevalence of Anaemia: Mild, Moderate and Severe anaemia agewise

Figure 2: Haemoglobin & PCV measurements in Men and Women- Percentagewise
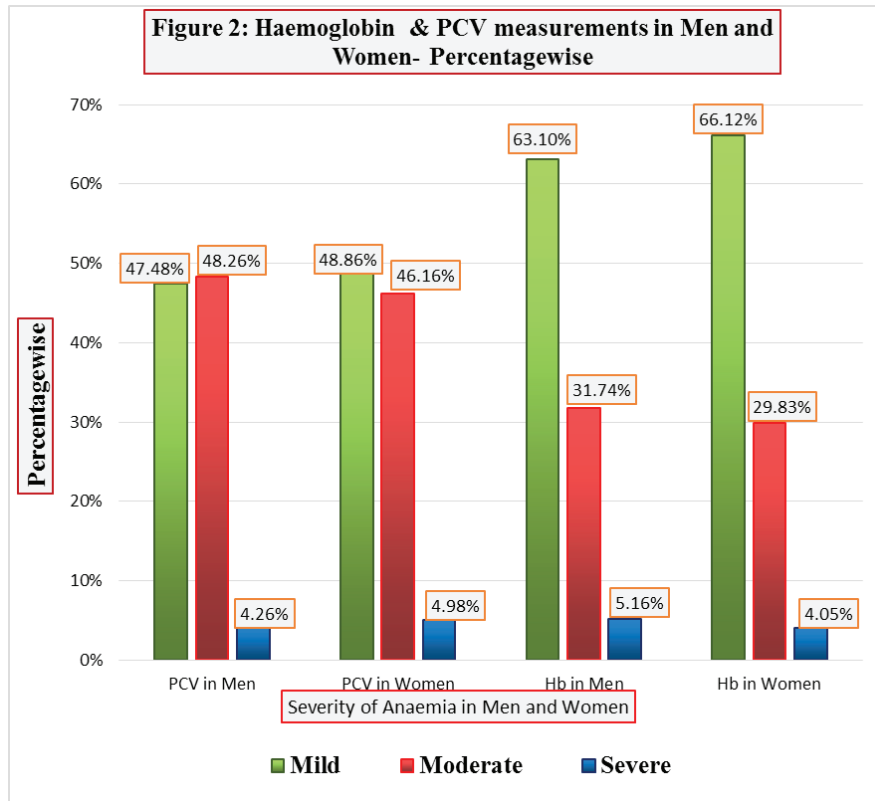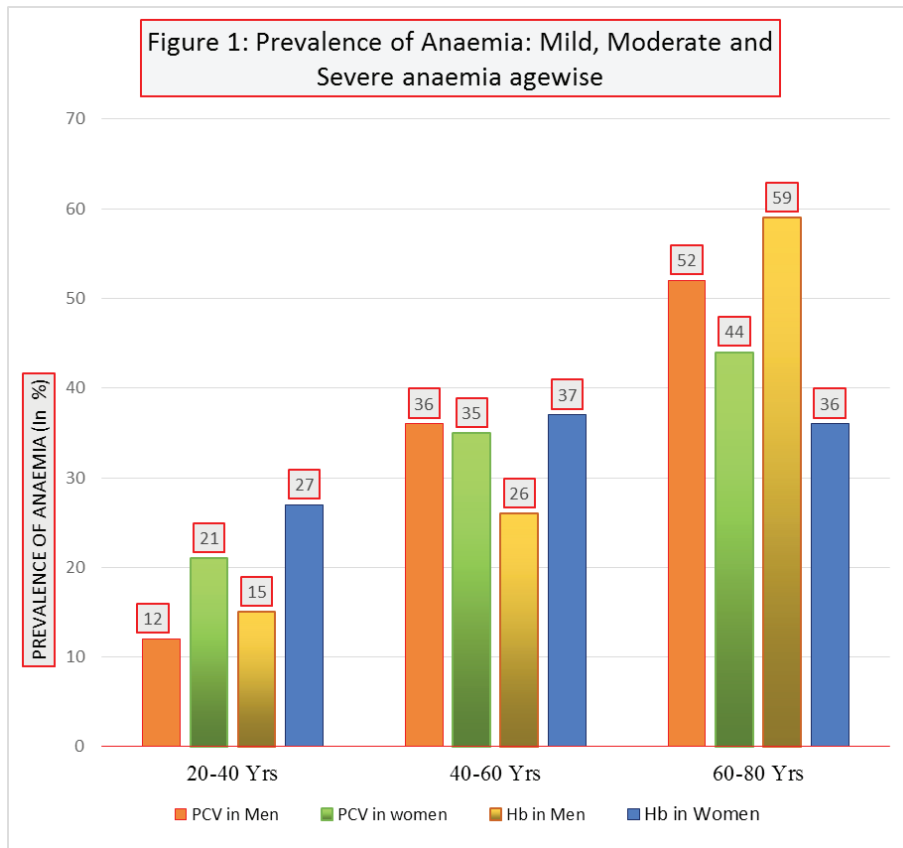
Discussion

The prevalence of any anaemia increases with age, affecting elderly quite often.[10] Present study evaluation was based onWHO criteria for anaemia which is based on haemoglobin and PCV concentration in adults.

This is one of the largest sample size study which included 71309 anaemic subjects. India has made great efforts to prevent anaemia. In particular, National Nutritional Prevalence Programme provides a free program of anaemia prevention, which has been involved in family planning services through primary health care since its inception in 1970.[11]

The overall prevalence in study conducted in north Indian population in year 1994 among women aged 20-40 years was 70.1%.[12]It is worth noting that there is no change in the last 27 years in the incidence and prevalence of anaemia.

According to our study, the prevalence of anaemia in women in the age group of 20-40 years was 65%. Present study shows 34% Moderateanaemia and 5% severe anaemia in the age group of 20-40 compared to 31% Moderate anaemia and 4% severe anaemia in the age group of 60-80 years. (Figure-1).

Anaemia among men and women is an important public health issue that has not received much research and policy attention so far.[13] Healthcare Professionals and Policymakers should consider expanding existing efforts to reduce anaemia not just in women but also to men.[14]

Prevalence and extent of anaemia irrespective of the etiology affects disease outcome in all acute and chronic conditions, whether it surgical wound healing, heart failure, diabetic foot ulcers etc. one third of men and two third of women in the given study population were seen to be anaemic of variable disease.

Limitations of the study: Interpretations of the study need to be studied in the light of following limitations of the study. Study is retrospective in nature with very limited clinical correlation .

Ethical Considerations: Approval from in-house Institutional Ethics Committee was taken before initiation of study.

Conflict of Interest: None declared

Source of Funding: None

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Oral Mucocele of Lower Lip - A Case Report

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Abstract

Aim: This paper reports a case of mucocele in the left side of the lower lip treated by conventional surgical excision of the lesion. Background: Mucoceles are most frequently occurring benign salivary gland lesion. The most common site of occurrence of mucocele in the oral cavity is the lower lip. Extravasation type is most frequently occurring lesion because of the extravasation of mucus secretion into the fibrous connective tissue that result from an alteration of minor salivary glands and ducts. The main etiological factors are trauma or lip biting habit. Because of its pathognomonic presentation, the diagnosis is mainly clinical. Histopathogical investigation is also necessary to rule out other salivary lesions or tumours. Case Report: In this report, a mucocele developed in the fourteen old year female patient is described. Surgical excision of the lesion was planned followed by the gentle dissection of the lesion. Histopathological examination revealed the presence of cystic cavity surrounded by the underlining connective tissue stroma, which consist of numerous salivary gland tissues lined by inflammatory cell infiltration suggestive of mucous extravasation cyst. Conclusion: Out of various treatment modalities, Simple surgical excision is the treatment of choice, alleviating patient's distress and discomfort. Clinical significance: Oral mucocele is the most common benign lesion occuring in the oral cavity in children. Thus clinical knowledge about the diagnosis and treatment of oral mucocele is necessary to avoid further complications in children.

Keywords: *Extravasation; Mucocele; salivary gland, Excision, Mucous, Cyst*

Introduction

Mucocele is one of the most common lesions of the oral mucosa that results from an alteration of minor salivary glands due to a mucous accumulation.[1] A mucocele is defined as a mucus-filled cavity that can appear in the oral cavity, appendix, gall bladder, paranasal sinuses, or lacrimal sac. The incidence of mucoceles is generally high, 2.5 lesions per 1000 patients, frequently in the second decade of life and rarely among children under one of year of age.[2] According to many studies there is no difference between genders but has a slight female

predilection.[3]The most frequent affected area is the lower lip, followed by floor of mouth, ventral tongue and buccal mucosa.They are mostly subdivided into two categories: Mucus extravasation cyst and Mucus retention cyst. Extravasation mucocele results from trauma tosalivary glands duct and the consequent spillage into the soft tissues around this gland. Retention mucocele appears due to a decrease or absence of glandular secretion produced by blockage of the salivary gland ducts.[4]There is no clinical difference between extravasation and retention mucoceles. Mucoceles can be single or multiple often rupturing and leaving slightly painful erosions that usually heal within few days.When located on the floor of the mouth these lesions are called ranulas because the inflammation resemblesthe cheek of a frog.Treatment options of mucocele include marsupialization, surgical excision, dissection, laser ablation, cryosurgery, steroid injection, and irradiation.[5]

Conventional treatment is commonly surgical extirpation of the surrounding mucosa and glandular tissue up tothe muscle layer. With a simple incision of the mucocele the mucus could drain and the lesion would recur. Superficial extravasation mucoceles resolve spontaneously. Small mucoceles can be removed completely along with the marginal glandular tissue before suturing. In the case of larger mucoceles, marsupialization is the choice avoiding damage to the vital structurures. Clinically there is no difference between both types of mucocele, and are therefore treated in the same manner.[5]

The clinical resemblance of mucocele has clinical resemblance with many other swellings and ulcerative lesions of oral cavity and hence needs to be differentiated carefully. Here we report an interesting case of mucocele in the inner aspect of lower lip.

Case Report

A fourteen-year-old female patient reported to the out patient department with the chief complaint of swelling on the left side of lower lip. (Figure 1)The history of present illness revealed the presence of swelling on the inner aspect of lower lip in relation to 31 and 32. Initially the swelling was of smaller size when the patient first observed it, but had grown over the past one month to attain the present size. Patient gave history of trauma one month ago while mastication. The patient's medical and family history was non-contributory.

Clinical examination revealed the presence of single, circular, slight bluish coloured swelling measuring roughly $0.8 \times 0.8 cm^2$ in size on the right side of lower lip with well circumscribed borders. It was soft and fluctuant in consistency and non tender on palpation with no increase in temperature. (Figure 1) The treatment plan was explained to the parents/caretaker and consent was signed by the parent and obtained.

Surgical excision of the lesion was planned followed by the gentle dissection of the lesion. Blood investigation was done and the values were observed to be within normal limits. Surgical excision of mucocele was performed under local anaesthesia (2% lidocaine with epinephrine 1:100.000; one cartridge) (Figure 2A, 2B, 2C)The surgical site was irrigated with povidone iodine and saline solution and sutured using 3-0 BBS sutures. (Figure 2) All post-operative instructions were given and analgesics were prescribed. The specimenwas placed in 10% formalin and sent for histo-pathological examination.

After two- week, regular follow up was done. Normal healing was appreciated and no recurrence of the

lesion was observed. (Figure 3)

Histopathological examination (Figure 4)revealed the presence of cystic cavity surrounded by the underlining connective tissue stroma, which consist of numerous salivary gland tissues lined by inflammatory cell infiltration suggestive of mucous extravasation cyst (Mucocele)

Figure - 1: Pre-Operative Picture

Figure - 2: Surgical Excision of Mucocele

A. Initial Incision
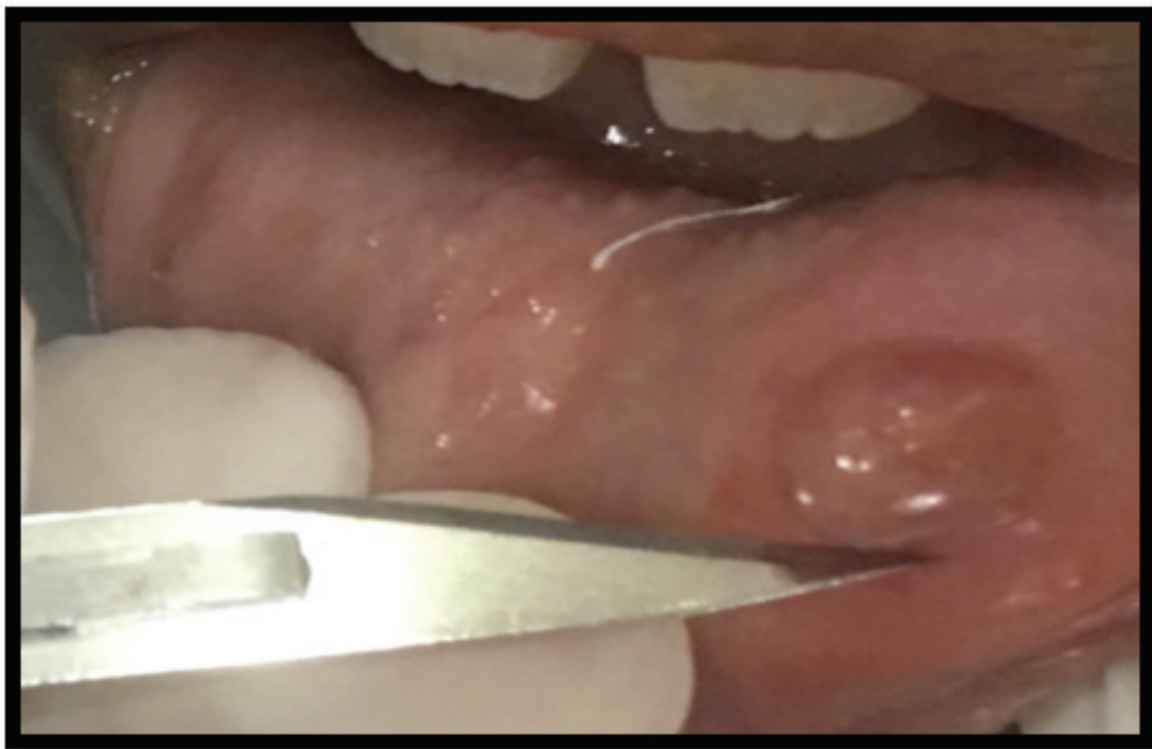
B. Complete Excision

C. Excised Mucocele Specimen
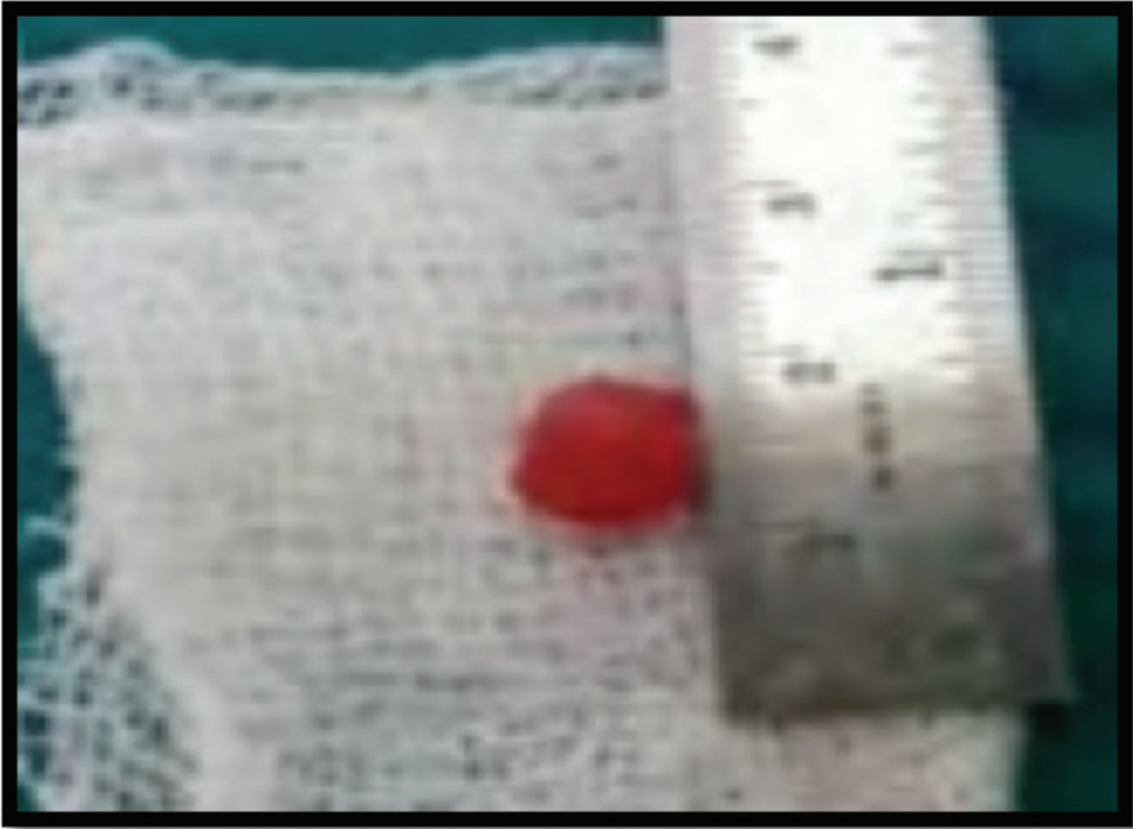
D. Post-Operative Picture after Placement of Suture
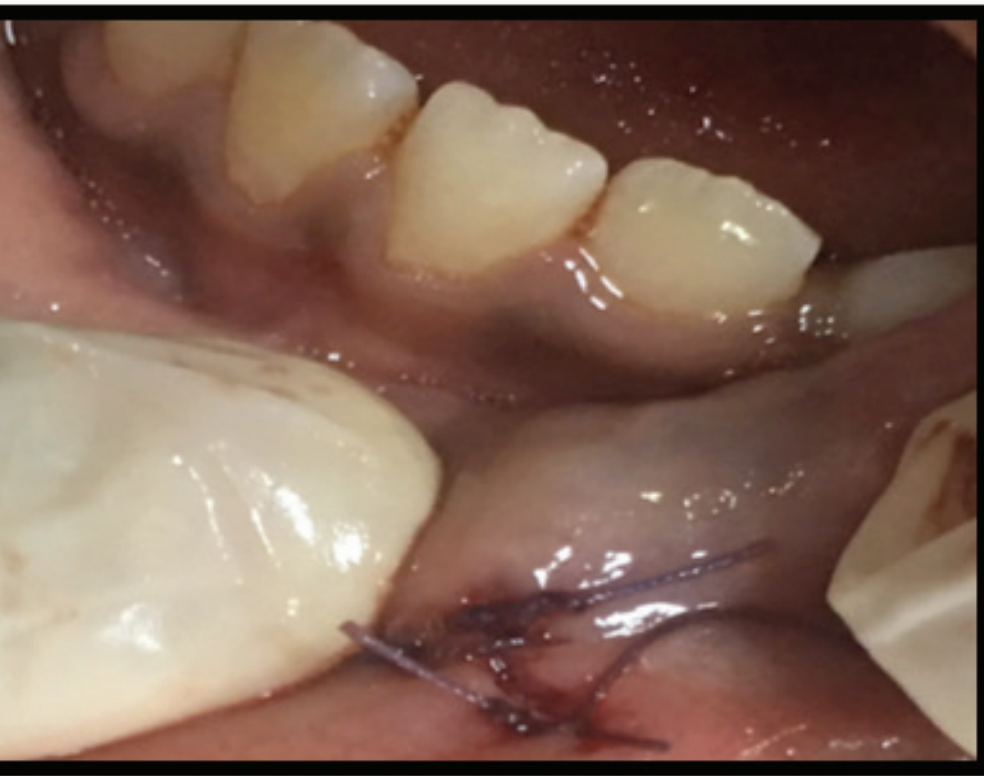
Figure - 3: Healing Appreciated at Two-week follow-up

Figure - 4: Histopathogical Picture
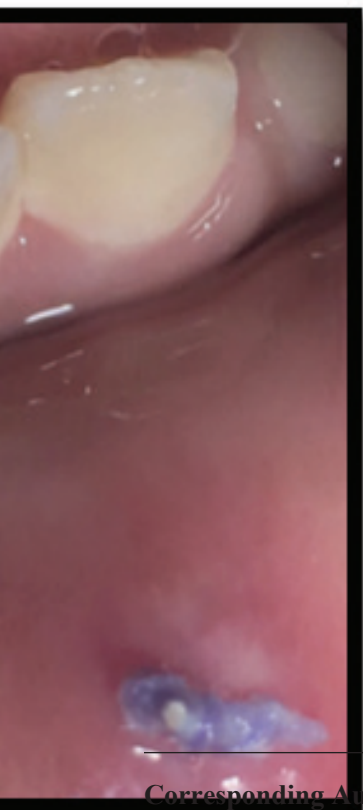
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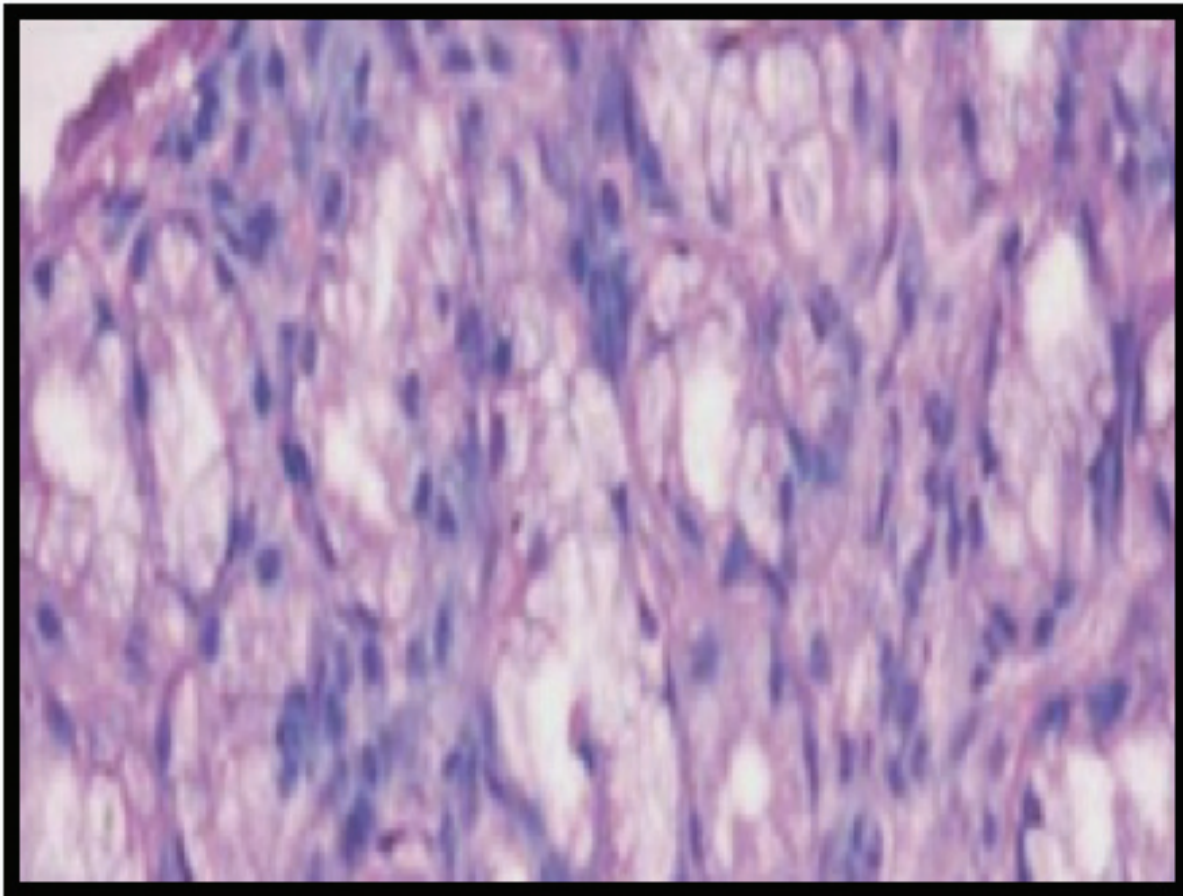
Discussion

Mococele is a benign cystic lesion of the oral cavity and it is the seventeenth most common salivary gland lesion in the oral cavity. Oral mucoceles represent an estimated 2% to 8% of all mucoceles.[6]

It is reported that lower lip is the most common site of occurrence of mucoceleas the upper canine teeth impinges on it and also the presence of many minor salivary glands in the lower lip.

It usually occurs as an isolated lesion, but sometimes multiple small lesions can also be present in case of superficial mucocele and appear as single or multiple blister.[7]

Trauma to the lower lip and obstruction of the salivary gland ducts are the most crucial etiological factors in mucoceles.They can cause distress and discomfort especially in the children without being associated with severe complications.

The most common treatment modality is surgical excision of the lesion along with the surrounding minor salivary glands.[8] Excising the mucocele along with surrounding glandular acini and removing the lesion down to the muscle layer, avoiding the adjacent gland and duct damage while placing the suture will reduce the chances of recurrence.

Apart from conventional treatment, other options have been reported in the literature such as cryosurgery, micro marsupalization and laser vaporization. Few reports have been reported about the use of corticosteroids as an injrection technique as an alternative to surgical techniques.[9]

Vaporization with argon, Nd:Yag and diode lasers has been used for treatment of mucoceles.Surgical

excision using lasers is well accepted by the patients, produce bloodless working area,reduced surgical time, no suture placement, reduced postoperative pain and discomfort, minimal scarring and less recurrence rates.[10]

Surgical excision of mucocele along with removal of the involved accessory minor salivary gland has been suggested as a treatment of choice because it is relatively economical procedure.Along with proper history, clinical examination, the excised tissue must be submitted for the histopathological investigations to confirm the diagnosis and rule out the salivary gland tumours.

Conclusion

Mucocele is one of the most common soft tissue lesions of the oral cavity which causes discomfort to the patient. Most of them are diagnosed clinically however histopathological reports are mandatory to rule out any other lesion. Mucoceles can be treated with invasive or non invasive methods. Out of various treatment modalities Simple surgical excision is the treatment of choice, alleviating patient'sdistress and discomfort.

Clinical significance: Oral mucocele is the most common benign lesion occuring in the oral cavity in children. Thus clinical knowledge about the diagnosis and treatment of oral mucocele is necessary to avoid further complications in children.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self

Ethical Clearance: Taken from Institutional Review Board

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Evaluation of Accuracy in Computer Guided Versus Free Hand Immediate Implant Placement in Fresh Extraction Sockets: a Randomized Controlled Clinical Trial

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Abstract

Background: The aim of this study was to compare between computer guided and free hand immediate implant placement in fresh extraction sockets in terms of accuracy of implant positioning.

Methods: This is a randomized controlled clinical study, which used CBCT imaging and flapless surgical technique to place implants in fresh extraction sockets. Accuracy measurements were done using BluSky®[1]software. A total of 22 patients were recruited according to inclusion and exclusion criteria.

Results: The mean values at the implant shoulder for implants inserted using computer surgical guides and those inserted using free hand technique in the mesiodistal direction were 0.69 and 1.43mm, respectively. While in the buccolingual direction they were 0.96 and 1.34mm, respectively. At the implant apex in the mesiodistal direction, they were 1.26 and 2.35mm, respectively. While in the buccolingual direction, they were 1.64 and 1.70mm, respectively. For the angular deviation they were 1.57 and 3.18mm respectively in the mesiodistal direction. Whilein the buccolingual direction were 1.29 and 7.76mm, respectively.

Conclusions: Accuracy of computer guided immediate implant insertion surpasses the freehand technique in the buccolingual direction in terms of placing Immediate Implants in fresh extraction sockets in maxillary estheticregion and thus the prosthetic aspect.

***Keywords:** Immediate Implants, Fresh extraction sockets,Accuracy, Guided surgery, Freehand, Deviation*

Introduction

It is claimed that placement of implant at time of extraction offers advantages over delayed implant placement such as; a shorter treatment time, preservation of the hard and soft tissues at the extraction site, better aesthetics, decreased cost, and higher patient satisfaction. [1][2]

However, there are factors in immediate implant insertion that can be considered as drawbacks complicating the technique and negatively affecting the outcome. Some of these factors were stated in literature including: "the morphology of the site, the presence of periapical pathology, the absence of keratinized tissue, thin tissue biotype and lack of complete soft tissue closure over the extraction socket."[1][2]In addition; implant placement in an ideal three dimensional position was found to be technically difficult in most

of the cases. Subsequently, the initial stability of the implant together with ideal prosthetic restoration were compromised.

According to the Consensus Statements and Recommended Clinical Procedures Regarding Contemporary Surgical and Radiographic Techniques in Implant Dentistry, it was stated that:" There are significantly more data to support the accuracy of computer-guided implant surgery. Meta-analysis of the accuracy revealed a mean error of 0.9 mm at the entry point (n = 1,530), 1.3 mm at the implant apex (n = 1,465), and a mean angular deviation of 3.5 degrees (n = 1,854) with a wide range in all measurements." Unfortunately, all the data supporting the accuracy of computer-guided implant surgery involves only implant insertion in healed sites and there is no enough evidence on the accuracy of using CAD/CAM guides in immediate implant insertion which is a whole different situation.

In an approach to reduce the drawbacks of immediate implant placement and to gain the merits of the computer guided implant placement, this study proposed immediate implant placement using computer manufactured surgical guides. The question remains whether the accuracy of implant positioning in computer guided immediate implant placement significantly outweigh that of the free hand or not.

Subjects and Methods

Study design: This was a randomized controlled clinical study with two arm parallel groups with allocation ratio 1:1

Eligibility criteria: Patients were recruited according to the following eligibility criteria:

a. Inclusion Criteria for participants:

1) Patients with hopeless teeth or remaining roots in maxillary esthetic region.

2) Presence of sufficient labial bone (at least 1.5 mm)

3) A minimum Bucco-lingual keratinized mucosa of 6mm or more [3]

4) Inter-arch space sufficient for prosthetic rehabilitation (7mm or more)[4]

5) Adults more than 18 years old

b. Exclusion criteria for participants:

1) Uncontrolled diabetic patients (HbA1c value $\geq$ 8.1 percent)[5][6][7][8]

2) Heavy smokers (More than 10 cigarettes per day)[9][10][11][12]

3) Severe bruxers [13][14][15]

4) Any systemic condition that may interfere with osseointegration

Recruitment: Subjects in the Outpatient Clinics of Department of Prosthodontics in Faculty of Dentistry were screened, and it continued until the target population was achieved.

Allocation: Participants were randomly assigned to either control or experimental group with a 1:1 allocation sequence, using a computer-generated sequence by the help of randomization software

Consent or assent

Principal investigator (DA) obtained a consent from patients willing to participate in the trial.

Interventions

A total of 22 patients were diagnosed and selected according to inclusion and exclusion criteria.

Case history &Clinical examination

Controlled diabetic patients were asked to bring a recent blood glucose test including both fasting/post prandial &glycosylated hemoglobin test (Hemoglobin A1c) to evaluate their status. Intraoral examination included assessment of the soft tissue surrounding hopeless teeth. Tooth mobility of adjacent teeth was tested to ensure that the remaining adjacent teeth were not mobile.

Virtual planning and construction of surgical guide

The CBCT image was used for the virtual surgical and prosthetic planning of implant placement using BlueSky®[1]software. For the computer guided group, a virtual guide was designed from the CBCT of the patient to be seated on neighboring teeth. The exported Standard Language transformation (STL) file of the virtual guide was sent to the Prosthodontic Department Digital Laboratory by e-mail for construction. For the freehand group, the planning stopped at virtual insertion of the implant after 3D visualization of the extraction socket.

Surgical Procedures:

The remaining root or tooth was extracted in an atraumatic procedure using lancet, periotome,and finally forceps with minimal force and rotational movement. After extraction, the socket was examined for intact labial and palatal bone using depth probe. If all walls were intact the socket would be eligible for immediate implant placement.

In the guided group, the computer manufactured surgical guide was used for implant drilling and placement following the manufacturer's instructions.

First the surgical guide was seated and checked for stability and adaptation.Osteotomy site preparation was then executed under copious irrigation with sterile saline. After osteotomy site was finally prepared, an implant of the planned dimensions was inserted through the surgical guide.

While in the free hand group, after tooth or root extraction, implants were placed using free hand technique guided by the extraction sockets and neighboring teeth.

Outcomes

All patients were imaged using CBCT postoperatively. All Deviation measurements between the virtual implant position and the actual implant position was calculated using Blusky® computer software.

Primary outcome: Linear deviation

The amount of linear deviation was measured through three parameters: global, lateral and depth deviation. These parameters were measured at the apical and coronal center in a mesiodistal and buccolingual plane. All three parameters were measured in millimeters.

Deviation measurement in the mesiodistal plane:

For measurement of deviation in the mesiodistal plane the 360 view was used. First an adequate slice "a slice which was crossing through both centers of the virtual and actual implants in the axial view" was chosen.

Global Deviation was measured by drawing a line connecting the centers (coronal & apical) of both virtual and actual implants. This line represented the amount of deviation the actual implant deviated from the plan. (Figure1)

amount of lateral deviation. (Figure2)
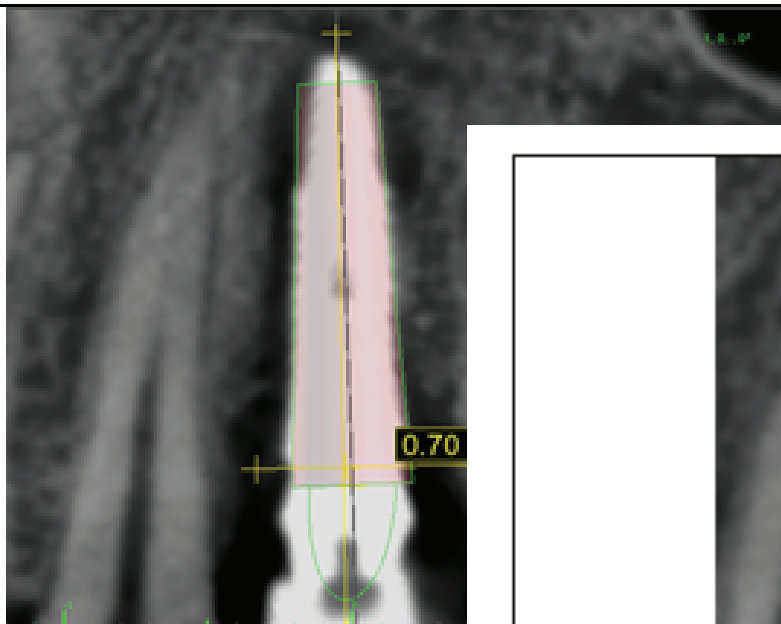
ure (1a): Coronal Global Linear de
mesiodistal p

Figure (2a): Coronal Lateral Linear deviation measurement in th
plane

(1b): Diagrammatic representat
on measurement in the mesiodi
of the virtual implant (a) to the cen

Figure (2b): Diagrammatic representation of Coronal Lateral Linear dev
measurement in the mesiodistal plane measured from the global cen
the virtual implant (a) to the point of intersection of the longitudinal a
the actual implant with the reference plane (b)

Lateral deviation measurem measured by a plane drawn longitudinal axis of the virtual implant and through the coronal (or apical) center and is referred as the reference plane. The horizontal distance between centers of virtual and actual implants represented the

Depth deviation was measured by connecting a line from the center of the reference plane of the virtual implant to the center of the actual implant vertically. (Figure3)
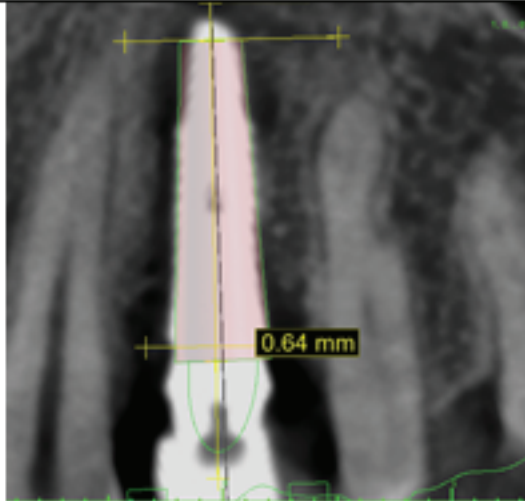
Figure (3a): Coronal Depth Linear deviation measurement in the mesiodistal plane

Virtual Implant
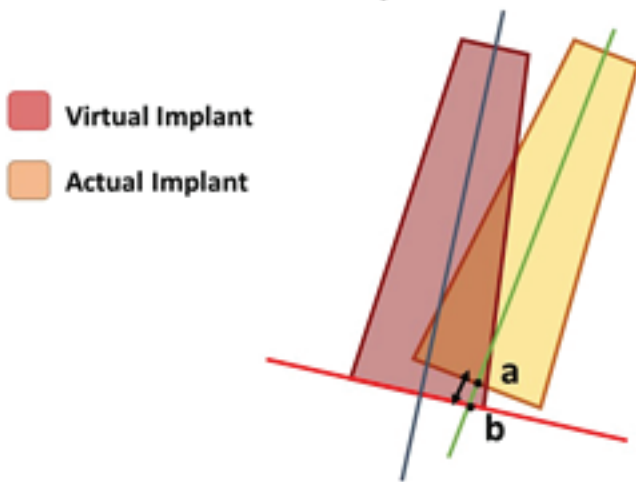
Actual Implant

Figure (3b): Diagrammatic representation of Coronal Depth Linear deviation measurement in the mesiodistal plane measured from the global center of the actual implant (a) to the point of intersection of the long axis of the actual implant with the reference plane (b)

Deviation measurements in the buccolingual plane:

For deviation measurements in the buccolingual plane the axial view was chosen. The slices were browsed at the coronal (or apical) portion of the virtual and actual implants until an adequate cross section was reached crossing both to appear as almost a complete circle.

The global deviation was measured from the center (coronal & apical) of the virtual and actual implant.

The lateral deviation was obtained as follow; a line parallel to the labial bone was drawn, then two lines were drawn from the center of both implants perpendicular to the parallel line. The difference between the two lines was the lateral deviation.

The depth deviation was measured as follow; the slices were scrolled up and down in the axial view until one of the implants (either the actual or planed) implant would disappear in the coronal (or apical) part of the implants. Once one of the implants disappeared the number of slices were counted until the other implant also disappeared. Each slice had a thickness of 0.3 mm; so, the depth deviation could be calculated and recorded. When implants deviated in less than 0.3 mm vertical deviation, they were viewed in the sagittal plane and the difference between them was measured.

Secondary Outcome: The amount of angular deviation was measured once in the mesiodistal plane and another in the buccolingual plane.

The angular deviation was measured in the panoramic view, which was the angle between the longitudinal axes of the two implants (virtual and actual).

Deviation Measurement in the buccolingual plane:

The angular deviation was measured in the sagittal view, which was the angle between the longitudinal axes of the two implants (virtual and actual). (Figure4)
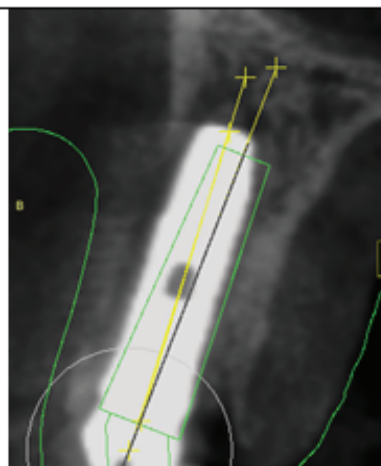
Figure (4a): Angular deviation measurement in the buccolingual plane
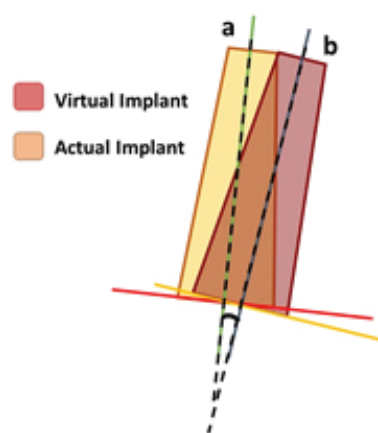
Figure (4b): Diagrammatic representation of Angular deviation measurement in the buccolingual plane, the angle was formed between the longitudinal axis of the actual implant (a) and the longitudinal axis of the virtual implant (b)

Statistical Methods

Statistical analysis was performed using SPSSsoftware. The study contained quantitative continuous data which were represented as mean + standard deviation.Kolmogorov-Smirnov (K-S) was used to assess normality of data distribution. Independent sample t test was used to compare the different deviation parameters between the two studied groups. Tests were considered statistically significant if the p- value was less than 0.05. Difference in means were calculated for the analysis of continuous variables with corresponding 95% confidence intervals. The results were tabulated and statistically analyzed by the help of a Professional academic statistician blinded to study groups.

Generalized Anxiety Disorder among Preschool Children in Baghdad, Iraq

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Abstract

Background: generalized anxiety disorder is a mental health disorder manifested by a lot of worry with no real cause and more intense than situation need. Few publications on anxiety among preschool anxiety in Iraq.

Objective: to report on generalized anxiety disorder among preschool children in Iraq (prevalence and determinant factors).

Methods: A total 423 preschool children was included in the study. They were recruited from 4 public and 4 private kindergartens. They were selected randomly from Al-Rusafa Al-Thania Education directorate (one out 3 directorates in Al-Rusafa). Spence Child Anxiety Scale-parent version was used to assess the anxiety.

Results: Generalized anxiety disorder was observed in 37.4% of children. Among the ages 4, 5, and 6 years, generalized anxiety disorder was observed in 37.2%, 35% and 4.3%, respectively. Rate of the disorder among males was 34.2% and among females was 40.2%. In public kindergartens the rate of the disorder was significantly higher (43%)than in private ones (31.6%). In low, middle and high socioeconomic status the rate of disorder were 57.7%, 29.2% and 34.4%, respectively. Paternal and maternal educational levels were significantly affecting the rate of generalized anxiety disorder (p = 0.003 and 0.009, respectively). The rate of the disorder among preschool children cared by one parent was significantly higher (86.6%) than those cared by both parents (27.4%) (p=0.0001).

Conclusion: A high prevalence of generalized anxiety disorder among preschool children was observed. Private kindergarten showed lower rate of the disorder than the public ones.

Keywords: preschool children, generalized anxiety disorder, kindergarten, Iraq

Introduction

Generalized anxiety disorder (GAD) is a mental health disorder manifested by a lot of worry with no real cause and more intense than the situation needs.

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[1]Children with GAD often worry about many things, such as future events, family matters,their personal abilities, andpast behaviors.[2]Anxiety as if it is a part of child growth that interfere with their normal activities. [3]

Few articles on preschool GAD were published in Iraq. This was the impetus to carry out this work. It was to report on GAD among preschool children in

Iraq.

Materials and Methods

A total of 423 preschool children were included in the study. They were recruited from public and private kindergartens. Al-Rusafaside of Baghdad was selected randomly from the two sides of Baghdad. Al-Rusafa Al-Thanihaeducation directorate was selected randomly out of 3 education directorate. Four private kindergartens and four public kindergartens were selected randomly from the selected directorate.

Spence child anxiety scale-parent version (SCAS-P) was used. The SCAS-P is with good psychometric properties [4]. It is of 29 items answered on 5 points Likert scale (0 = never to 4 = very often true). The disorder was dichotomized (anxiety and no anxiety) [4].

Socioeconomic status was determinedusing the recent published data [5].

The data was collected by direct interview with one parent, usually the mother. Chi square or Fischer's Exact Test were used to examine the impact of independent variables (age and sex of the child, type of kindergarten, SES, and education of the parent) on dependent variable (GAD). P value < 0.05 was considered significant.

Results

Out of total, 158 (37.4%) children were with GAD.

Table 1 shows the rate of GAD was 51 (37.21%) at age 4 years, 55 (35%) at age 5 and 52 (40.3%) at age 6 years old. There was no significant association between GAD and age of preschool children (χ^2=0.8, d.f.=2, p=0.6).

There was90 (40.2%) were with GAD among femalesandamong male was 68 (34.2%). There was nosignificant association between GAD and sex (χ^2=1.6, d.f.=1, p=0.2).

Table 1: Age and sexdistribution of generalized anxiety:

Age	Total No.	Generalized Anxiety	
		positive	
		No.	%
4	137	51	37.2
5	157	55	35
6	129	52	40.2
Total	423	158	37.4
		χ^2=0.8, d.f.=2, p=0.6	
Sex	total	Yes	
	No.	No.	%
Male	199	68	34.2
Female	224	90	40.2
Total	423	158	37.4
		χ^2=1.6, d.f.=1, p=0.2	

At public kindergartens GAD was observed in 91 (43.1%) children and in 67 (31.6%) children at private kindergartens. There was a significant association between GAD and type of kindergartens (χ^2 =6, d.f.=1, p=0.01)(Table 2).

High rate of GAD 60(57.7%) among children of low socioeconomic status families and of families of middle socioeconomic status was 66 (29.2%) children and among families with high socioeconomic status 32(34.4%). There was a significant association between GAD and SES (χ^2 = 25.1, d.f.= 2, p =0.0001). (Table 2).

Table 2: Generalized Anxiety distribution according to type of kindergarten and SES:

Kindergarten	Total No.	Generalized Anxiety	
		Positive	
		No.	%
Public	211	91	43.1
Private	212	67	31.6
Total	423	158	37.4
		$\chi 2$ =6, d.f.=1, p=0.01	
SES	Total No.	Positive	
		No.	%
Low	104	60	57.7
Middle	226	66	29.2
High	93	32	34.4
Total	423	158	37.4
		$\chi 2$ = 25.1, d.f.= 2, p =0.0001	

Among the postgraduate educated fathers, there were 43 (51.8%) children with GAD, graduate fathers 88 (31.8%), and among undergraduate fathers 27 (42.9%) children with GAD. There was a significant effect of SES on anxiety among preschool children (χ^2 = 25.1, d.f.= 2, p =0.0001).

GAD among preschool children of Graduated mothers was 90 (33.7%), postgraduate mothers in 31 (35.6%) and undergraduate mothers 37 (53.6%).

There was significant association between GAD and maternal education (χ^2 = 9.4, d.f.= 2, p =0.009) (Table 3).

Children cared by one parent showed that 84 (86.6%) were with GAD and those cared by both parents showed 74 (27.4%) were with GAD. There was significant association between GAD and caregiver of children (χ^2 = 9.4, d.f.= 2, p =0.009) (Table 3).

Table 3: Distribution of Generalized Anxiety according to paternal, maternal education and caregiver of children:

Paternal education	Total	Generalized Anxiety	
		Positive	
	No.	No.	%
Postgraduate	83	43	51.8
Graduate	277	88	31.8
undergraduate	63	27	42.9
Total	423	158	37.4
		$\chi2 = 11.9$, d.f.= 2, p =0.003	
Maternal education	total No.	Positive	
		No.	%
Postgraduate	87	31	35.6
Graduate	267	90	33.7
undergraduate	69	37	53.6
Total	423	158	37.4
		$\chi2 = 9.4$, d.f.= 2, p =0.009	
Caregiver	total No.	Positive	
		No.	%
One parent	97	84	86.6
Both parents	271	74	27.3
Total		$\chi2 = 154$, d.f.= 1, p =0.0001	

Discussion

GAD was defined by DSM-5 as disorders of excess fear and related behavior [6]. DSM-5 provides 11 different anxiety disorder, and only 4 for preschool period (GA, Social anxiety, Separation anxiety, specific phobia). This work was dealing with GA.

This study showed that the rate of GAD was 37.4%. It is much higher thanthat reported in literature (2.6 %)[7]. This variation might be attributed the current instability, wide spread of violence, poverty and the failure of the education and health systems are severely undermined the well-being of Iraqis, especially children. [8,9] Publishing data documented that the deterioration in education and health system

in Iraq.[10,11] The noticed variation might be, also, due to methodological factors (different instruments, time frames and variation in threshold used to identify GA).

In this study, there were no impact of ageand sex on GAD. This finding is in line of that reported in literature. [12,13]

GAD was significantly higher at public kindergartens (43.1%) than that in private kindergartens (31.6%) (p=0.01). This variation might be due todeterioration of infrastructure of public kindergartens. Private kindergartens provide good care of children, they were with modern infrastructure, and they provide all playful tools to make the child happy. Several reports documented the deterioration in public kindergartens.[14,15]

The study revealed that preschool children from low SES showed significantly high rate of GAD (p=0.009). This finding agreeswith that reported in publication.[16]

Children cared by one parent were with significant higher complain of GAD (86.6%) than those cared by both parents (27.4%) (p = 0.0001). This might attribute to increase in stress on child by absence of one parent. It is consistent with that reported in other countries.[17]

This study shows significant association between the paternal and maternal education with the anxiety of children. GAD of children increased with parents have undergraduate education (secondary school or less). This might be due tothe education of parents plays important role in upbringing of the children.[13]

Conclusion

Ahigh rate of GAD among preschool Iraqi childrenwas observed. Private kindergartens showed lower GAD than that in public ones.

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On Participation in Antenatal Classes Depending on the Academic Educational Status of the Mother

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Abstract

The question of whether women attend antenatal classes depends on various factors and is important to ask, because attending antenatal classes shows a conscious awareness of pregnancy, a concern and a sense of responsibility as a mother and towards the not-yet-born child at an early stage. To evaluate the extent to which participation in antenatal classes depends on the academic level of education of the mother, women who gave birth between 1950 and 1990 were interviewed with a questionnaire.

The results of the study show the correlation between the mother's education and attendance of antenatal classes.

Keywords: *Breastfeeding , Breastfeeding behaviour, Breast milk, Mothers, Image of women , Gynaecology, Obstetrics, Paediatrics*

Introduction

The question of maternal behaviour and preparation for childbirth is still a relevant topic that has not been sufficiently researched. Explicitly, the dependence of mothers' behaviour on their level of education has a large research gap. This article shows the relationship between attending antenatal classes and the mother's level of education.

It refers to a previous study (Harrich, F. H. M., Zum Wandel des Stillverhaltens von Müttern im Großraum Düsseldorf zwischen 1951 und 1990 - Eine Oral History Studie, p. 29, Düsseldorf, 2020) and in combination with two other studies forms a quintessence (Heininger, L., On the change in breastfeeding behaviour in the FRG between 1950 and 1990, p. 29, Düsseldorf, 2014., Freiin Teuffel von Birkensee, A. C., The breastfeeding behaviour of female academics in the period from 1950 to 1990, p.

65, Düsseldorf, 2014.).

Material and Methods

The reference studies in this meta-analysis are named as followed:

Study A: "The breastfeeding behaviour of academic women in the period from 1950 to 1990" by Antonia Charlotte Freiin Teuffel von Birkensee. [4]

Study B: "On the change in breastfeeding behaviour in the FRG between 1950 and 1990 - An Orla History Study" by Luisa Heininger. [8]

Study C: "On the Change in Breastfeeding Behaviour of Mothers in the Greater Düsseldorf Area between 1951 and 1990 - An Oral History Study" by Friederike Helene Margarethe Harrich. [6]

The three studies A, B and C were carried out as retrospective studies. In the studies A and B, the survey

data were collected by means of a phone interviews; in study C, the study participants filled out a postal questionnaire, followed by a face-to-face interview. Both methods have the benefit of significantly reducing the effect of peer social desirability in the form of impression management and self-deception. The questionnaires differ marginally, but they also contain identical questions. In this meta-analysis, all similar questions are compared with each other. The study designs of the three studies to be compared are very similar, comparable but not identical. For example, it is noticeable that the time periods studied slightly differ. [4, 6, 7, 8]

In summary, Study A deals with the breastfeeding behaviour of academic women during the period mentioned, Study B with non-academic women during the period mentioned and Study C has a mixed study population. This and a closely matched study design provide optimal opportunities for comparison. [4, 6, 7, 8]

It can be noted that study A deals with the breastfeeding behaviour of academics in the mentioned period, that study B deals with non-academics in the mentioned period and that study C shows a mixed study population. [4, 6, 7, 8]

This and a closely aligned study design provide optimal opportunities for comparison.

In the compared studies, the study participants were divided into four cohorts per study. The following two tables show the cohort distribution.

Cohort 1	Cohort 2	Cohort 3	Cohort 4
Birth of the first child between 1950 and 1960	Birth of the first child between 1960 and 1970	Birth of the first child between 1970 and 1980	Birth of the first child between 1980 and 1990

Fig. 1: Cohort classification in study A and B.[6]

Cohort 1	Cohort 2	Cohort 3	Cohort 4
Birth of the first child between 1951 and 1960	Birth of the first child between 1961 and 1970	Birth of the first child between 1971 and 1980	Birth of the first child between 1981 and 1990

Fig. 2: Cohort classification in study C.[6]

The following is an evaluation of the percentage of women in different educational situations who attended a birth preparation course, depending on the destination of the birth.

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Yes	12 %	72 %	72 %	88 %
No	88 %	28 %	28 %	12 %

Fig. 3: Participation in a birth preparation course, study A.

Question to study participants: Have you attended a birth preparation course?

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Yes	8 %	24 %	68 %	64 %
No	92 %	76 %	32 %	36 %

Fig. 4: Participation in a birth preparation course, study B.

Question to study participants: Have you attended a birth preparation course?

	Cohort 1	Cohort 2	Cohort 3	Cohort 4
Yes	0 %	36,4 %	63,6 %	72,7 %
No	100 %	63,6 %	36,4 %	27,3 %

Fig. 5: Participation in a birth preparation course, study C.

Question to study participants: Have you attended a birth preparation course?

In the evaluation of the results of study A, it becomes clear that there was a massive increase in birth preparation courses in the 1960s. This increase continued through the 1970s and reached its maximum in the 1990s, with 88% of women attending the course.

The non-academic women participating in study B show a different behaviour in percentage terms. However, the trend is the same. If birth preparation courses are increasingly not attended in the 1950s, this changes over the course of the decades, but much later, more weakly and less markedly than in study A. There is even a slight drop in the values from cohort 3 to cohort 4 with a participation in birth preparation courses of 64% in cohort 4.

Study C shows with academics and non-academics a mixed picture of the study results from study A and B, which is to be expected and which reflects the trend described and represents a moderate maximum of participation in a birth preparation course of 72.7% in cohort 4.

Conclusion

Comparing the percentages of study participants in studies A, B and C who attended a birth preparation course, one point becomes clear: regardless of whether the participants were academics or not, there is a comparable development over the decades. The trend is evident in all three studies compared. While in the 1950s very few or even no women in the cohort studied attended a birth preparation course, this changed significantly in the 1960s and 1970s and the number of women attending a birth preparation course rose to a predominant percentage across all studies. So it seems to be a development and a trend over time, which is nevertheless associated with the academic level of education of the women or their husbands.

Ethical Clearance: Ethical clearance was taken from the Ethics Committee of the Heinrich-Heine-University Düsseldorf, Germany

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Treatise on Distribution of Mode of Delivery of Academically Educated Mothers Vs Non-Academically Educated Mothers

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Abstract

In the publication „Guiding principles for complementary feeding of the breastfed child", the WHO advocates that exclusive breastfeeding during the first six months after birth is essential for the development of the newborn. Of particular interest is the possible difference between academic and non-academic women, which has not been studied so far. First, however, there is the question of how children can be breastfed when the professional situation of mothers has changed considerably due to a changing image of women in society. Women are making more and more different decisions, which are increasingly developing within the framework of an emancipated image of women that is constantly changing. [4, 6, 7, 14]

For this purpose, Dr. med. Friederike Harrich interviewed mothers about their situation and evaluated them in a large-scale study. This study was compared with two other studies in order to pool the data. [1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14]

This study, as part of a larger series of studies, addresses the distribution of mode of delivery of academically educated mothers vs non-academically educated mothers and presents the differences and similarities depending on the mother's level of education. [4, 6, 7]

Keywords: *Breastfeeding, Breastfeeding behaviour, Breast milk, Mothers, Image of women, Gynaecology, Obstetrics, Paediatrics*

Introduction

Due to many different influencing factors, which depend on the pregnancy and breastfeeding behavior of the mothers, there are many differences in the behavior and handling of their children and in the context of pregnancy, which have not yet or not yet sufficiently been investigated.

This paper, as part of a large series of studies, asks whether there is a correlation between the type of delivery and the educational status of the mother.

Material and Methods

The reference studies in this analysis are called as below:

Study A: "The breastfeeding behaviour of academic women in the period from 1950 to 1990" by Antonia Charlotte Freiin Teuffel von Birkensee. [4]

Study B: "On the change in breastfeeding behaviour in the FRG between 1950 and 1990 - An Orla History study" by Luisa Heininger. [8]

Study C: "On the change in breastfeeding

behaviour of mothers in the greater Düsseldorf area between 1951 and 1990 - An Oral History Study" by Friederike Helene Margarethe Harrich. [7]

The studies A, B and C were done as retrospective reports. In studies A and B, data were acquired by means of a phone interview; in study C, a questionnaire was filled out in person by the study participants on their own, followed by a personal interview. Both methods have the benefit of greatly reducing the effect of social desire in the form of impression management and self-deception. The survey questionnaires differ marginally, but they also contain similar questions. In this meta-analysis, all comparable surveys are compared with each other.[4, 6, 7, 8]

Results

	Kohorte 1	Kohorte 2	Kohorte 3	Kohorte 4
Natürliche Entbindung	92 %	92 %	88 %	76 %
Entbindung per Kaiserschnitt	8 %	8 %	12 %	24 %

Tab. 1: Verteilung der Entbindungsform, Studie A. [4]

	Kohorte 1	**Kohorte 2**	**Kohorte 3**	**Kohorte 4**
Natürliche Entbindung	100 %	100 %	100 %	100 %
Entbindung per Kaiserschnitt	0 %	0 %	9,1 %	0 %

Tab. 2: **Verteilung der Entbindungsform, Studie C** [7]

The analysis of the distribution of the mode of delivery in study C shows a homogeneous picture in cohorts 1,2 and 4. 100% of the women in these cohorts gave birth naturally.[7]

The results of studies A and C were evaluated across all cohorts with regard to delivery in natural form or by cesarean section. In study B, no information was provided in this regard. The overall picture is homogeneous. The comparison of the two studies shows no significant differences under the aspects mentioned.[4, 6, 7, 8]

Vaginal delivery was preferred among academics as well as among academics and non-academics and also took place in this way, whereby academics and non-academics pooled from study C can show a higher percentage of vaginal deliveries. [4, 6, 7]

Conclusion

The difference in the percentage of natural deliveries between academics from Study A and academics and nonacademics from Study C is 18% in the analysis of Cohort 18, this is equally the case in the analysis of Cohort 2 results. In the results of

Cohort 3, the difference is 2.9%. Looking at these results, it is noticeable that the mentioned difference reaches a maximum of 24% in cohort 4.[4, 6, 7]

As expected, reciprocal values are found in the evaluation of the results of cesarean delivery.[4, 6, 7]

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De Quervain's Disease among Motorcycle Repair Mechanics and Related Factors

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Abstract

Introduction: Work-musculoskeletal disease is still an occupational health problem worldwide that needs to be investigated in every different type of work.

Objectives: Identify De Quervain's disease (DQD) prevalence on motorcycle repair mechanics and it's risk factors.

Methods: A cross-sectional study on 60 motorcycle repair mechanic in Samarinda city of Indonesia. To determine DQD, a Finkelsteins test was performed. Age, education background, working period, working time per day, and frequency of repetitive motion of the mechanic were collected by direct interview. The number of samples using the Lemeshow formula. Phi coefficient test is applied to identify the correlation between DQS prevalence and other parameters.

Results: the DQD prevalence of 63.3% was found, occurred in right and left hands, 36 and 24%, respectively. It correlates significantly with age *(p=0.047, r=0.346)*, working period *(p=0.000, r=0.861)*, education background *(p=0.045, r=0.367)*, working time per day *(p=0.055, r=0.616)*, and frequency of repetitive motion *(p=0.004, r=0.374)*.

Conclusions: The prevalence of DQD in motorcycle repair mechanics is quite high and requires attention, prevention and control from stakeholders so that the prevalence does not increase.

Keywords: *De quervain's desease; Motorcycle repair mechanic; age; working period; educational background; working time per day; repetitive motion.*

Introduction

Work-related musculoskeletal disorders (WMSDs) are still a common occupational health problem around the world and have caused considerable losses. In the US, WMSDs contributed 29-35% of all occupational injuries and illnesses, and were the main cause of work disability and decreased work productivity.[1] In Europe, WMSDs accounted for 53% of all work-related diseases, and are the leading cause of work disability, sickness absence from work, presenteeism, and loss of productivity across all the European Union (EU) member states.[2]In Asia (such as in Japan and Korea), WMSDs are one of the most important problems in the occupational

health system and constituted the fifth rank of diseases that cause disability, 42.2 million (41.2%) Japanese adults suffered WMSDs.[3]In Indonesia, a survey by the Ministry of Health of 9,482 workers in 12 districts/cities showed that the highest rate of work-related disorders is WMSDs (16%), followed by cardiovascular disorders (8%), nervous disorders (5%), respiratory disorders (3%) and ear nose throat disorders (1.5%).[4]

The most common of WMSDs is De Quervain's disease (DQD), a repetitive stress condition located at the first dorsal compartment of the wrist at the radial styloid. DQD is a stenosing tenosynovitis of the first extensor compartment containing abductor pollicis longus (APL) and extensor pollicis brevis (EPB). Pain is felt over those tendons at the radial border of the wrist, mainly with thumb and along with wrist movement.[5,6]It is reported that the prevalence of DQD in the working population worldwide is 0.7-36%, but the epidemiological information regarding this disease is still scant,[7] and the prevalence rate and cause-specific risks of these three tendinopathies have not yet been clarified.[8] No long-term epidemiologic study has been done of the prevalence of de Quervain disease, but it is known to be relatively common.[9]

Some of the DQD risk factors that have been identified include: in the working population in France the risk factors consist of repetitive movements, forceful manual exertion, the sustained and awkard posture of the wrist;[7] in the general population of women in Taiwan, risk factors consist of chronic disease and using hormone antagonist during the prior 3 years;[8]for general workers, risk factors consist of repetitive motion, forceful, and ergonomically stressful manual work;[10]in cell phone users, DQD is significantly associated with frequent text messaging;[11]for tailors, DQD is significantly related to the working pattern;[12]and in medical student, gender, and repeated/sustained bending of the wrist in extreme posture were risk factors of developing the DQD.[13] To determine the risk factors for DQD in a specific job, this study aims to determine the prevalence of DQD in motorcycle repaid mechanics and analyze related factors.

Methods

A cross-sectional study has been conducted on motorcycle repair mechanics in Samarinda city of Indonesia. The number of samples used in this study was 60 respondent using the Lemeshow formula.[14]The inclusion criteria consisted of willingness to be a respondents, aged 18 to 57 years, working as a motorcycle repair mechanic and not having any other job, and the exclusion criteria consisted of a history of trauma/fracture/dislocation of the hand and wrist, a history of arthritis and a history of medication of quinolone/ofloxacin antibiotics.

To determine De Quervains disease in mechanics, a Finkelsteins test was performe.[15,16] Age, education background, working period, working time per day, and frequency of repetitive motion of the mechanic were collected by direct interview. Questions included in the question were feelings of pain or discomfort in the area around the thumb and wrist before work, at work, and after work; the voice of crackles on the finger joints and wrists; swelling around the thumb and wrist; thick feeling of the thumb; thumb stiff and difficult to move.

The Phi coefficient test[17] was applied to see the correlation between DQD and independent variables (age, working period, educational background, working time per day, and repetitive motion). Interpretation of the correlation power (r) between variables as follows, ≤ 0.35 are generally considered to represent low or weak correlation, 0.36 to 0.67 modest or moderate correlation, and 0.68 to 0.89 strong or high correlations, and ≥ 0.90 very high correlations.[18]

Results

The age category of motorcycle repair mechanics in this study was mostly less than 40 years (76.7%) and 23.3% were more than 40 years old. All motorcycle repair mechanics in this study were male. Senior high school (graduated 12th class) is the dominant education background level of the mechanic (56.7%) and 61.7% of the mechanic has working experience of more than 3 years. Most of the mechanics have working time per day for more than 8 hours (93.35%) and have repetitive motion more than 20 times per minute (68.3%). Most of the motorcycle repair mechanics (63.3%) have DQD in right and left hand of 60 and 40% respectively. Analysis by Phi correlation coefficient showed that all characteristics observed on motorcycle repair mechanics are significantly associated with DQD prevalence (Table 1.).

Table 1. Characteristics of motorcycle repair mechanic (n=60) and Association between It's Variables and DQD prevalence

Variables	Number	(%)	Correlation*	
			r	p
Age (years)			0.346	0.047
< 40	46	76.7		
≥ 40	14	23.2		
Gender			-	-
Male	60	100		
Female	0	0		
Education background			0.367	0.045
Never go to school	5	(8.3)		
Elementary school (graduated 6th class)	7	(11.7)		
Secondary high school (graduated 9th class)	11	(18.3)		
Senior high school (graduated 12th class)	34	(56.7)		
Diploma/Bachelor	3	(5)		
Working experience (years)			0.681	0.000
< 3	23	(38.3)		
≥ 3	37	(61.7)		
Working time per day (hour)			0.616	0.055
< 8	4	(6.7)		
≥ 8	56	(93.3)		
Repetitive motion per minute (times)			0.374	0.004
< 20	19	31.7		

***Cont ...* Table 1. Characteristics of motorcycle repair mechanic (n=60) and Association between It's Variables and DQD prevalence**

≥ 20	41	68.3		
De Quervains disease				
Yes (+)	38	63.3		
No (-)	22	36.7		
De Quervains disease locations				
Right hand	36	60		
Left hand	24	40		

*) Phi correlation test

Most of the main complaints of DQD experienced by motorcycle repair mechanics are pain/discomfort around the thumb and wrist after work, the joint of the thumb feels stiff when moved, thick feeling on the thumb, and pain/discomfort around the thumb and wrist while work, adn pain/discomfort around the thumb and wrist before work with a percentage of 53.3, 50, 45, 41.7% and 37.7, respectively (Table 2.)

Table 2. The main complaint of De Quervains disease felt by motorcycle repair mechanics (n = 60)

No	Complaints	Yes		No	
		Σ	%	Σ	%
1	Pain/discomfort around the thumb and wrist before work	23	37.7	38	62.3
2	Pain/discomfort around the thumb and wrist while work	25	41.7	35	58.3
3	Pain/discomfort around the thumb and wrist after work	32	53.3	28	46.7
4	Crepitus/crackles on the finger joints and wrists	16	26.5	44	73.3
5	Thick feeling on the thumb	27	45	33	55
6	The joint of the thumb feels stiff when moved	30	50	30	50
7	Difficulty moving the thumb	12	20	48	80

Discussion

De Quervains diseasee (DQD) Prevalence

De Quervains disease (DQD) prevalence among motorcycle repair mechanics found relative high (63.3%), dominate by right hand (60%), with the main complaint of pain/discomfort around the thumb and wrist after work (53.3%). The results of this study complement research in other types of work, including pianists, a prevalence of 59.9% (n = 200),[19] in medical students it was found that the prevalence of DQD was 44% (n=137),[13] In tailors, 75% had De Quervain's

Tenosynovitis, 72% had in right hand and 28% had in left hand (n=100),[12] and among the regular computer operators, found 99 (67.3%) showed the Finkelstein's test positive, while 48 (32.7%) showed the pain in Finkelstein's test as being negative (n = 147).[5]

Factors affected DQD Prevalence

Age of motorcycle mechanic

We found that age of motorcycle repair mechanics has associated with the DQD prevalence with low/ weak correlation *(p=0.047, r=0.346)*. In accordance with the previous research that the age of workers is a factor that can increase the risk of developing De Quervain's disease, this is due to degenerative changes in the aging tendon,[7] and De Quervain disease is a result of an intrinsic degenerative mechanism rather than an inflammatory one.[9] The results of this study confirm previous research by Wolf et al,[20] who concluded that age greater than 40 was also a significant risk factor for DQD in a young active population. The results also complement previous studies which concluded that age is an individual risk factor for DQD.[7,21] Based on this result, it is recommended along with increasing mechanical age, it is recommended to reduce workload and reduce work time.[22]

Working period

The motorcycle repair mechanics are mainly divided into two different categories i.e. mechanics with working period < 3 years (38.3%) and ≥ 3 years (61.7%). The working periode is associated with the DQD prevalence *(p=0.000)* with strong/high correlation *(r=0.681)*. More working experience affected significantly the DQD prevalence. More working experience gave lower MSDs prevalence. According to Luttman et al,[22] working period indicate the length of time the worker is exposed to hazards at work. The longer the working period, the higher the risk of that person experiencing occupational diseases. Repetitive and monotonous work without job rotation

can cause the muscles and soft tissues in the body part to be burdened and result in injury to that part of the body. Prevention of DQS from getting worse/ increasing due to the working period is similar with the effect of age of the motorcycle repair mechanics as described above.

Working time per day

In this study, the working time of mechanical motorcycle repair is categorized into 2 (more than 8 hours and less than 8 hours per day). The results showed that most of the mechanics worked more than 8 hours per day (93.3%) and were shown to be significantly associated with DQD *(p = 0.055)* with strong/high correlation *(r=0.616)*. According to ILO,[23] (and this standard has been ratified by the government of the Republic of Indonesia) the allowed working time for industry is a maximum of 8-hours day or of the 40-hours week. Working more than standard working hours without being properly managed will adversely affect workers' health. The increase in working time reflects the increased frequency of repetitive motion by the mechanics. According to Foye's,[24] repetitive minor trauma or excessive use of the fingers (overuse) generally contributes/aggravates the development of DQD disease.

Repetitive motion

Repetitive motion of the mechanics in this study is associated significantly with DQD prevalence *(p=0.004)* with moderate correlation *(r=0.374)*. These data confirm previous reports showing that repetitive motionis associated significantly with DQD prevalence for computer operators,[5] in Frech working population,[7] for general workers,[10] for phone cell user,[11] for tailors,[12] and in Germany workers.[21]

In accordance with the basic theory of the occurrence of DQD, repeated movements of the wrist and thumb extension over a long period of time cause repeated microtrauma, leading to DQD.[25] Excessive

repetitive movements that overload the carpethacarpal I joint can cause rupture and inflammation due to friction, pressure, and lack of blood flow (ischemia) in the joint area. Very long periods of repetitive hand movements (at a frequency of> 20 times per minute) can cause inflammation of the tendon sheaths.[21] Le Manach[7] concluded a significant correlation between De Quervain's Syndrome with repeated and continuous bending and twisting movements using the wrist. Repetitive and continuous wrist bending in extreme positions for> 2 hours per day and continuous and repetitive screw-turning movements for> 2 hours per day are risk factors for De Quervain's Syndrome.

The results of this study support the previous conclusion that bending of the wrist with repetitive hand movements is also considered a significant factor contributing to diseases such as *tendinitis*, *synovitis*, *tenosynovitis*, *DeQuervain* and *epicondylitis*.[26] The implication of these results, so that DQD in motorcycle repair mechanics does not get worse is advice to reducing repetition frequency, using various tools to facilitate/lighten the work, avoid manual handling of the heavy objects, repeat change between activation and relaxation of the hand.[22]

Limitation of the study

This study only uses the Finkelstein test to determine the incidence of DQD. Although this method is superior to Eichhoff's Test in the Investigation of de Quervain's Disease,[15] however, Finkelstein's test alone does not appear to validly and reliably assist in the assessment and diagnosis of De Quervain's disease.[27] Therefore further tests are recommended to combine with other tests such as Eichhoff's test, and/ or the wrist hyperflexion and abduction of the thumb (WHAT) test.[6]

Conclusions

Among 60 motorcycle repair mechanics studied, DQD prevalence was found at about 63.3%, dominate by right hand (60%), with the main complaint of pain/discomfort around the thumb and wrist after work (53.3%). These DQD were associated with age *(p=0.007, r=0.346)*, working period *(p=0.000, r=0.861)*, education background *(p=0.045, r=0.367)*, working time per day *(p=0.055, r=0.616)*, and frequency of repetitive motion *(p=0.004, r=0.374)*. To solve this problem, it is necessary to reduce workload and work time, introducing a training to increase the interest on prevention DQD, reducing repetition frequency, using various tools to facilitate/lighten the work, avoid manual handling of the heavy objects, repeat change between activation and relaxation of the hand.

Conflicts of Interests: Nil

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Systematic Review of Neonatal Pain Management with 25% Dextrose Versus Direct Breast Feed Milk During Painful Procedure

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Abstract

This systematic review is the product of 25 top published journals. The search engines adopted in this study werePubMed, Medline, CINHAL, Cochrane Library, Google Scholar, and Research gate. The inclusion criteria were:1.Papers published between 2000-2020, 2.Top tier journal articles (High quality), 3. Term Healthy neonates and preterm neonates, 4.Neonates undergoing various painful procedures and Neonates receive different pain relief interventions. The key searching words were Neonates, Painful Procedures, BCG Vaccination, 25% Dextrose.

The present paper highlights that 25% dextrose and direct breastfeed milk relieves neonatal pain. The gate-control theory also discusses the idea of central control through modulation of nerve impulses in descending fibbers from the brain. The gate tends to close when cognitive activities such as distraction (e.g., breastfeeding) are processed along these fibres, therefore preventing the transmission of pain through a "descending blocking action." This mechanism also affects various pain entities such as anxiety, anticipation, and memory of prior experiences.

This paper shows the research gaps from different studies in the review of the literature. In this present study of systematic review, 25 recent multiple interventions based on RCTs studies between 2010 to 2020 were systematically reviewed using the keywords search method. The findings are discussed and research gaps related to the RCTs are listed accordingly.

***Keywords** –BCG immunization, dextrose25%, direct breastfeed,Neonates,other pain relieving measures, painful procedure, Vaccination,*

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Introduction

Most of the neonates routinely undergo painful invasive procedures in the Hospital. It is now well recognized that even preterm neonates are anatomically and physiologically capable of feeling pain. Pain among neonates can evoke negative behavioral, physiologic, or metabolicresponses and

may be associated with long-term consequences. As neonates cannot verbalize their pain, they depend on others to recognize, access, and manage their pain.

BCG Vaccination is an important routine procedure in the pediatric health care system which brings down the mortality as well as morbidity among children. Even though the vaccine has its advantages it also has its adverse effects as well as complication such as swelling, pain, redness. Pain produced by this intentional vaccination procedure varies based on various factors such as the medications used, the quantity of the medications used, size of the gauge of the needle used, the position of the neonate, and the muscles used /handled by the health care providers during vaccination procedure Vaccination does not produce pain alone but also causes anxiety and stress in [neonates] and among their parents.[1]

Neonates respond to painful stimuli differently which is difficult to identify and treat. Generally, there is a myth among people that a neonate does not feel pain as it has immature neural development; it is dangerous to give the neonates powerful analgesia because of the risk of addiction. In the year 2014 neonatal pain management review practice in the intensive care unit neonates, experience has highlighted an average of 11 painful procedures per day out of which 60% of neonates do not receive any kind of pain-reducing or management medication. There is a need for creating evidence for an intervention, which is safe, simple, practical, and effective in relieving the pain among neonates during intradermal vaccination. Various individual non-pharmacological interventions were reported effective in the alleviation of pain in newborns in various situations.[2]

Amy Marchant's (2014) study found that the nervous system of the newborn is underdeveloped for pain sensation. Pain amongst some of the neonates is hard to investigate because neonates are unable to communicate pain and there is no specific biological marker of pain available to identify the pain. It can be identified only through behavioral and stress-related physiological parameters. Neonates only identify pain but do not experience pain due to cortical development. Pain-relieving measures to alleviate distress from 'painful' procedures for newborn needs further investigation.[3]

According to Tania Habib Mundol et al 2017, Neonates undergoing painful procedures can be given oral sucrose or glucose solutions combined with other pain relief protocols to manage their pain. Whenever sucrose or glucose is administered to manage the pain, it has to be administered and followed as a medication; evidence-based protocols have to be developed and implemented in nurseries, and more research can be conducted to better understand the effects of sucrose use for pain relief.[4]

Modarres, M, Jazayeri, A., Rahnama, P. et al 2013 study was a step forward among similar studies for 2 reasons, first, it was assured if breastfeeding was real by observing sucking movement, secondly, breastfeeding begun during & after immunization. Breastfeeding during vaccination was considered effective in relieving pain in neonates. Immunization causes pain while administering to neonates and is considered the most common source of pain among children. Their finding concludes that breastfeeding reduces pain & is an effective way for pain[5]

Saeed Zaman Khattak S. has done a study in the neonatal intensive care unit (NICU) of the military hospital (MH) Rawalpindi to assess neonatal pain with the use of a modified Behavioral pain scale (MBPS) 2 minutes before the painful procedure babies were given 10% dextrose and sterile water and neonates pain was assessed. The study concluded that 10% dextrose is easily available as a cheap solution that can be used for pain relief management in NICU during painful procedures including immunization.[6]

An RCT was conducted using Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library2011, Issue 10), Medline (1966 to February 2011), annual meetings abstract of the society for pediatric research (1994 to 2011) to evaluate the effectiveness of breastfeeding or supplemental breast milk in reducing procedural pain in neonates. The author concluded that administration of breastfeeding or breast milk has to be used to relieve the pain of neonates who are undergoing a single painful procedure rather than placebo, positioning, or no intervention.[7]

A prospective, double-blind, randomized controlled trial study has been conducted to compare the effect of expressed breast milk (EBM), 25% dextrose (D25), and sterile water (SW) on procedural pain in neonates. A premature infant pain profile (PIPP), was used to assess the pain. and other physiological parameters such as changes in heart rate(HR), oxygen saturation(SPO2), and duration of crying were recorded. It was found 25% dextrose and expressed breast milk were effective interventions for a reduction in pain response in newborn babies during venipuncture. 25% dextrose was found to be superior to EBM for pain reduction.[8]

As per the Gate control theory *Substantia Gelatinaseis* a functional unit of densely packed cells that extends the length of the spinal cord, is the site of a transmission-blocking action that closes a gate to impulses entering the spinal cord on their way to the transmission cells. Non-nociceptive touch fibers are stimulated conversely when open, the gate permits sensory input to reach the transmission cells in the dorsal horn of the spinal cord allowing the perception of pain to get through, this potential blocking mechanism can result in little or no pain perception regardless of the intensity of the painful stimuli and can be activated through – touch –stimuli of the skin such as scratching, rubbing, etc.There is central control through modulation of a nerve in descending fibers from the brain.[9]

According to Cheryl tansky, Claire E lidenberk (2009) conducted study on breastfeeding as a pain intervention when breastfeeding an infant in Riddle memorial hospital as per their study breast feeding decrease pain perception and the gate tends to close when cognitive activities like breastfeeding are processed along these fibers.Therebypreventing the transmission of pain through descending blocking action. This mechanism affects various pain entities such as anxiety, anticipation and memory of prior experiences.[10]

Literature Analysis and Discussions

Table -1 provides a relevant literature survey of the present topic from India and Global locations. The papers were selected based on keywords as given in Table -1

Table -1 Keywords search strategy with several papers

Keywords	No of papers
25% Dextrose	9
Breast Milk	14
BCG Vaccination	6
Neonates Pain	14
Other pain-relieving measures	6

This table provides a set of papers extracted from scholarly Archives such as; PubMed, CINHAL, Cochrane, Google Scholar, Research gate. A total of 50 papers were located based on the inclusion criteria as given below

1. Period of published research (2000 – 2020)

2. Top tier journal articles (High quality)

3. Term Healthy neonatesand preterm neonates

4. Neonates undergoing various painful procedures

5. Neonates receives different pain relief intervention

Results

A total of 25 papers were qualified as secondary data for thesystematic review. Table 2 presents the systematic review of different elements of effectiveness of 25% Dextrose and direct breast milk on clinical outcome of neonates during BCG vaccination.

Mundol TH et al.(2018) conducted a study on 80 neonates during their routine BCG vaccination and concluded that neonates in the experimental group who received 25% Dextrose were found to have fewer indicators of pain. The clinical outcome like oxygen saturation along with heart rate was not assessed in the study.The research recommended to have future study on increased sample size for obtaining a statistically significant conclusion.[4]

Kavthekar S et al.(2016) performed a double-blinded randomized placebo-controlled trial to compare the oral 12%,24%,25% Dextrose and placebo during DPT vaccination. The research gap in the study was that the researcher checked the duration of cry and behavioral state for only one group who received 24% dextrose. All thethree groups were administered 12%, 24%, 25% Dextrose as per the randomization; if the researcher had checked duration of cry and other clinical outcomes. He would have been able to produce the evidence as to which solution is more effective to relieve the pain of neonates.[11]

GibbinsS et al.(2002) Reported from his study on preterm and term neonates who were subjected to many painful procedures and he compared the efficacy and safety of 3 interventions during heel lance procedure. Total 190 samples of newbornsdivided in to 3 group and administered sucrose & nonnutritive suckingfor group 1, sterile water & nonnutritive sucking for group 2, only sucrose solution for group 3.The research gap in this study is that author selected the samples of term and preterm neonates. Here the preterm sucking reflexes are not well developed and may not be effective to assess the pain with nonnutritive sucking. Hence it is insignificant to generalize.[12]

Larry Gray MD et al(2015) Carried out a RCT on 29 neonates. The authors administered 25% Dextrose for the experimental group, radiant warmer for the control group, 2minutes before DPT vaccination. Oral dextrose reduced the crying time of infants experiencing procedural pain. The research gap in this study is the small sample size, hence insignificant for generalization. Therefore, a large sample size for this research for obtaining a statistically significant conclusion is needed.[13]

Harrison D et al(2010) conducted a study to find out the analgesic effects of sweet solution during the different painful procedures like heel lance, venipuncture and IM injection on preterm and term neonates. The research gap in this present study is that the intensity of pain varies for each procedure. The preterm and term neonate's pain also varies according to their gestational age. This study concluded that the effect of the sweet solution wasno longer existed for only a single procedure among healthy preterm and term neonates.[14]

Sujatha.S et al (2013) studied155 healthy neonates to relieve pain by using the simple non-pharmacological procedure of facilitated tucking position for the control group and24 % oral sucrose solution for the experimental group during BCG

vaccination. The research gap is that author did not make any inclusion criteria of neonates who cried during the procedure due to diaper wet, and sick during the procedure.[15]

Mitra S.E. et al(2013)in a comparative study studied the vaccinated-related pain among 96 infants who received massage therapy or breastfeeding during Hepatitis B andDPT vaccination. The research gap from the above literature is the small sample size. A similar study can be carried out with more samples to generalize the outcomeand separately with different vaccination procedures.[16]

Hameed Uddin Ahmed, Praveen S, Sindhoor. et al(2019) The objective of the study was to compared the analgesic efficacy of expressed breast milk and 25% Dextrose solution at the time of Hepatitis B vaccination at birth on 70 neonates. In this study, only the duration of cry was observed and another clinical parameter was not checked and the sample size was also small. Therefore the research gap is: large sample size is required for the statistically significant conclusion.[17]

Prakashkumar S Shah et al.(2012) compared RCTs of breastfeeding or supplemental breast milk versus no treatment/other measures among the neonates. In this study, many interventions were compared and assessed on healthy neonates. The research gap in this study is that the preterm population was not studied.The effectiveness of breast milk for the painful procedure should be studied in the preterm population, as there are a limited number of studies in the literature.[18]

Harrison D et al.(2016) conducted a RCT to assess the effect of breastfeeding during the painful procedure.The study included an age limit of 28 days of the postnatal period to 12 months and different painful procedures like subcutaneous,intramuscular, intravenous IV line,venipuncture, heel lance, finger

lance were included. The research gap in this study is that the pain perceptions vary as the age increases and according to the type of procedure.[19]

Jawad Yousaf Dar et al.(2019) performed an RCT to assess the neonates' pain during BCG vaccination during breastfeeding *vs.* routinecare. The breastfeeding group was found to have reduced pain, decreased physiological and behavioral response during BCG vaccination. The research gap is they have not mentioned the duration of breastfeeding.[20]

Gaurav Goswami et al (2013) studied a comparative randomized placebo-controlled trial to assess the analgesic effect of direct breastfeeding, 25% dextrose,and placebo on 120 children during DPT vaccination. The research gap in this study is that the clinical outcome of heart rate, respiratory rate, and oxygen saturation was not checked. It is recommended to check the duration of cry within 3 minutes of intervention instead of 1 minute and 3 minutes.[21]

Luvena Rodrigues et al (2017) conducteda RCT in 40 preterm neonates to compare 25% dextrose with breast milk analgesic effects during nasopharyngeal suctioning. The research gap in this study is the small sample size selection. The author concluded that there was no significant reduction in the pain level of neonates in both experimental group 25% and control group expressed breast milk group due to insignificant difference between the interventions. But the analgesic effect of breast milk was sustained needs further specification about the intervention administered.[22]

Boronumandfa K et al (2009) concluded that 25 % dextrose or breast milk orally given to 40 babies had significantly reduced the pain. The research gap in this study is: The sample size for this study is very small size for obtaining a statistically significant conclusion.[23]

SitiYuyunRahayaFitri, et al (2020)conducted an RCT study to compare sensorial saturation with sucrose, sensorial saturation with breast milk, and sensorial saturation alone among 108 neonates during venipuncture procedure in Indonesia. The study was conducted between 3 groups did not make any difference in pain relief. The research gap in this present study is that the researcher has not specified the effect of sucrose alone. Further specification is needed about the effects of each intervention.[24]

A.IqbalR.Malik, Msiddique, M Yaqub, T.Iqbal, H. Farrukh. (2014) conducted an RCT on breastfeeding for pain relief 2 minutes before, duringandafter BCG vaccination on 150 full-term neonates. The breastfeeding group had a significantly lower level of pain score during the BCG vaccination. The research gap in this study is that the pain scale (DouleurAigue Du Nouveau – ne scale) used in the study was a very elaborative one to assess the pain of neonates during BCG vaccination.[25]

RaziehFallah, NaeimahNaserzadeh, Farad fedosianandFabribaBinesh (2017) did a comparative study in shahidSadough University of medical sciences Iran.The author compared the effectiveness of kangaroo mother care (KMC), breastfeeding and swaddling during BCG vaccination for 120 neonates. The neonates were divided into 3 groups; one group was given breastfeed, the second group KMC, third group received swaddling. The research gap in this study isthe group which was given breastfeed showed less pain compared to other group but the group which was kept on KMC also had chances for the suckling of the mother's breast and the smell of the mother which was not given attention. Further studies need to be done in this regard.[26]

Sujaha S, Rebecca Samson, Sundarressan (2013) conducted a double-blinded RCT in the postnatal ward of a tertiary care Hospital at Puducherry to assess the effect of expressed breast milk 1 ml and facilitated tucking during BCG vaccination. The researcher checked the behavioral change, duration of cry and other physiological parameters. The research gap in this study is that 1 ml of breast milk is very little for the healthy term neonates. This should have been calculated according to the body weight, behavioral changes not specified the type of behavior checked in this study.[27]

S.R Ravikiran, P.M Jagdeesh Kumar andAnand D, Manndi (2011)studied76 infantsfrom the outpatient department of KVG Medical College in Karnataka,those who received BCG vaccination followed by Hepatitis B vaccinationand their pain level was assessed with a 10 cm visual analog scale. In this present study the author wanted to find out the pain threshold is more in administration of BCG vaccination first followed by Hepatitis vaccinationThe result of the study revealed that administer of BCG first followed with Hepatitis B vaccine lowers pain compared to administration of Hepatitis –B vaccination first followed by BCG vaccination.. The research gap in this present study is that the Use of 10cm visual analog scale for the vaccination needs to be different because pain threshold differs in both the routes of administration of the vaccine. BCG given in 25-26 gauge needle intradermal and for Hepatitis –B given in 22-25 gauge needle intramuscular. Thus visual analog scale may not be appropriate to assess both the type of vaccination.[28]

Aguilar Cordero Met al (2014)performed a comparative study between oral glucose and breast milk as a strategy for pain reduction during the heel lance procedure in 93 neonates in San Cecilio University Hospital in Canada. The pain and discomfort decreased due to the presence of high content of beta-endorphin level in the breast milk. The research gap in this study is the large sample size for this research is needed to obtain a statistically significant conclusion.[29]

Conclusion

In this paper, we reviewed the current RCTs of Indian and Global studies. Very limited studieswere carried out in India.These studies also suggest the need to do further investigation to find the best doses, timing and ways of giving the 25% Dextrose and any side effects.

A review asking these questions found that there is too little evidence to answer it; breastfeeding was found to be a good way of relieving pain and better than sucking on a dummy, being held, or being swaddled and place in a crib. This knowledge is only useful if parents andpractitioners use it!The present systematic review highlights 20 research gaps. Researchers must identify these gapsand bring out the best result of RCTs in India as well as in the Global setup.

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COVID-19 Health Warningsamong Low Socio-Economic People: A Cross-sectional Study in Bangladesh

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Abstract

The present world is passing a great pandemic where Bangladesh facing an unavoidable challenge to cope up with COVID-19. The government and other health organizations haveannounced somehealth warnings to prevent COVID-19 and make people aware. The study aims to explore the health warnings status (knowledge and practicesof health warnings) among low socio-economic people in Bangladesh. This cross-sectional study was conducted with 400 participants (low socio-economic people) by using the purposive sampling and semi-structured questionnaire survey over six months. This study illustrates that 60% of respondents noticed they and their family members are very aware and knowledgeable about COVID-19where 36.5% are conscious to make their family aware about corona virus. About 32% of respondents use mask when they go to outside during corona period where 25% use hand sanitizer. It is found that there is a significant association between occupation, age and perception on people's awareness about COVID-19 at 1% level of significance where ($p<0.002$), ($p<0.001$) respectively. Along with, educational qualification is also significantly associated at 10% level of significance where ($p<0.08$).Most of the respondents have moderate level of knowledge and awareness about COVID-19 health warnings.

Keywords: *Knowledge, Awareness, Practice, COVID-19, Health Warnings, Bangladesh.*

Introduction

The World Health Organization declared COVID-19 as a pandemic on March 11, 2020, owing to its fast spread across the world. It began in Wuhan, Hubei province, in December 2019 and following that, on 8 March 2020, the first corona-infected patient was discovered in Bangladesh. In comparison to other countries, Bangladesh's infection rate has been relatively constant, but has already exceeded the control threshold[1]. As of 1 June 2021, Bangladesh has recorded 800,540 corona virus infections, including 12,619 fatalities, and recovered 740,372-corona virus-affected patients[2]. Since then, Bangladesh has adopted a number of measures to combat COVID-19[3].

Concerning COVID-19 prevalence, the government has taken more measures to prevent COVID-19 transmission among the Bangladeshi population, including evacuation, travel and entry restrictions, social isolation, and ultimately a lockdown on Dhaka[4, 5]. However, effective treatments need public acceptability, which is affected by people's knowledge, attitudes, and practices (KAP) about COVID-19[6,7].Only a few studies on awareness and behavior during epidemics have been conducted in

Bangladesh, but findings indicate that awareness and behavior toward contagious diseases are associated with severe fear and other emotional responses within the society, which may obstruct efforts to prevent disease transmission[8,9]. KAP protection against COVID-19 and government regulations governing public transportation is a critical cognitive cornerstone of public health in terms of health protection and promotion[10]. In Hubei, China, one of the first studies of COVID-19 attitudes and knowledge revealed a significant correlation between sentiments opposing government attempts to fight the epidemic and COVID-19 knowledge[11].

According to several investigations, the researcher encountered a lack of KAP and compliance with health warnings to COVID-19. The purpose of this study is to explore the health warnings status (knowledge and practices of health warnings) among low socio-economic people in Bangladesh. The study's results will be a roadway for policymakers on public awareness, attitudes, practices, shortfalls, and the authority's sincerity about the successful implementation of initiatives related to health warnings about COVID-19 by the government of Bangladesh.

Methods

Study Design, Area and Period

This cross-sectional survey was conductedamong low socio-economic people who living in Demra and Tongi industrial areas in Bangladesh over six months from July to December 2020 after widely spreading COVID-19 throughout the county.

Study Population

This purposive sampling study targeted all the low socio-economic people who living in Demra and Tongi industrial areas in Bangladesh during the COVID-19 Pandemicto understand the awareness warning of COVID-19 attitudes and health risk factors associated with it.

Sample Size and Sampling Technique

Using purposive sampling, the total of 400respondents were selected by taking 50% prevalence and by adding 5% non-respondent error.

DataCollection

Purposive sampling was used to collect data, which were gathered through a semi-structured questionnaire. The research gathered only quantitative data through face-to-face interviews. Theprinted protocol was incorporated with different predetermined statements to get a comprehensive picture of awareness warning of COVID-19 among low socio-economic populations with yes, no, and remark options that must observe.

Statistical Analysis

The study data were collected via face-to-face interview using semi-structured questionnaire and then raw data from interviews were checked, cleaned, processed, and codified for reliability and validity. The available latest version of Statistical Package for Social Sciences (SPSS version 25.0) and MS Excel was usedto describe the basic features of the data in the study through frequencies and percentage.

Results

Knowledge and Awareness Status about COVID-19

Figure 1 reveals that three-fifth (60%) of the respondents noticed they and their family members are very aware and knowledgeable about COVID-19 where two-fifth (40%) of the respondents and their family members are not aware about COVID-19.
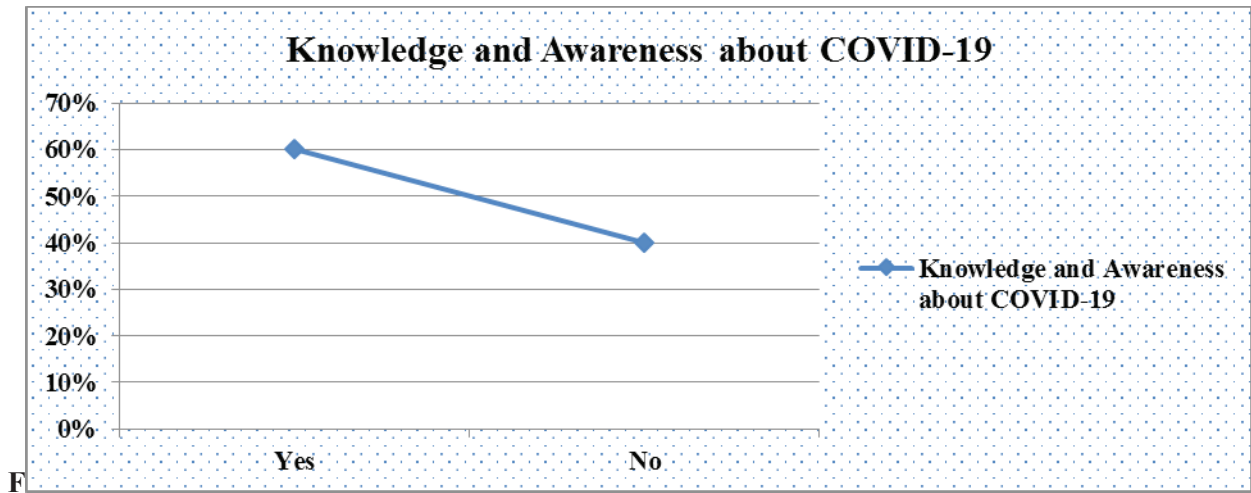
igure 1: Knowledge and Awareness Status of the respondents about COVID-19

Knowledge, Attitude and Practice (KAP) of Health Warnings

Table 1describes that more than half (58.2%) of the respondents did not opine anything about making aware their family members about corona virus where more than one-third (36.5%) of the respondents opined that they are conscious to make their family aware about corona virus. More three-fifth (66%) of the respondents did not opine anything about having nutritious food during corona period. More than one-fourth (27%) of the respondents opined that they try to drink lemon water & tea during corona period. Along with that, more than one-fourth (27%) of the respondents opined that they try to wash hand and face by soap/hand wash during corona period. On the other hand, more three-fifth (70%) of the respondents opined that they take bath by soap after coming home from outside during corona period.

Table 1: Respondent's Knowledge, Attitude and Practice (KAP) of Health Warnings

Variables	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	Number	%	Number	%	Number	%	Number	%	Number	%
Making Awareabout COVID-19	4	1.0	17	4.3	233	58.2	146	36.5	00	0.0
Travelling During Corona Period	20	5.0	20	5.0	256	64.0	104	26.0	00	0.0
Usage of Mask	4	1.0	12	3.0	256	64.0	128	32.0	00	0.0
Use of Hand Sanitizer	16	4.0	20	5.0	264	66.0	100	25.0	00	0.0
Maintaining Safe Distance	36	9.0	20	5.0	248	62.0	96	24.0	00	0.0

Cont... **Table 1: Respondent's Knowledge, Attitude and Practice (KAP) of Health Warnings**

Usage of Hand Sanitizer	4	1.0	4	1.0	16	4.0	260	65.0	116	29.0
Having Nutritious Food	4	1.0	4	1.0	264	66.0	128	32.0	00	0.0
Drinking Lemon Water& Tea	4	1.0	4	1.0	8	2.0	276	69.0	108	27.0
Washing Hand And Face	12	3.0	12	3.0	268	67.0	108	27.0	00	0.0
Taking Bath By Soap	8	2.0	8	2.0	12	3.0	280	70.0	92	23.0

Reasons of Indifference Regarding Health Warnings

The Table 2 reveals that three-fifth (91%) of the respondents noticed that for financial crisis of people they don't stay at their home during corona period where almost a cent percent (98%) of the respondents noticed that for less implementation of laws they go to outside for their task during corona period. More than half (150%) of the respondents noticed that for their incognizance they do not use mask when they go to outside for their task during corona period. More than one-third (120%) of the respondents noticed that for bigotry they do not avoid handshake when they go to outside for their task during corona period.

Table 2: Reasons of Respondent's Indifference Regarding Health Warnings

Variables	Ignorance		Incognizance		Bigotry		Don't Adjust With New Hygiene System		Less Implementation of Laws		Financial Crisis	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Reasons for absence in home	16	4.0	152	38.0	16	4.0	136	34.0	152	38.0	364	91.0
Reasons of going outside	152	38.0	4	1.0	60	15.0	80	20.0	392	98.0	00	0.0
Reasons of not using mask	8	2.0	600	150.0	136	34.0	312	78.0	128	32.0	00	0.0
Reasons of not using hand sanitizer	16	4.0	632	158.0	152	38.0	440	110.0	48	12.0	16	4.0
Reasons of not maintaining social distance	16	4.0	632	158.0	24	6.0	296	74.0	4	1.0	4	1.0
Reasons of not covering face during coughing	8	2.0	608	152.0	104	26.0	456	114.0	16	4.0	16	4.0
Reasons of not avoiding handshake	584	146.0	160	40.0	480	120.0	8	2.0	00	0.0	00	0.0
Reasons of not avoiding seating closely	248	62.0	124	32.0	232	58.0	148	37.0	72	18.0	48	12.0

Relationship between Perception on Aware About COVID-19 and Background Characteristics

Table 3 depicts there is association between perceptions on aware about COVID-19 and religion at 5% level of significance. Among the Muslim, 79.8% Muslim have perception that people are not aware about COVID-19 whereas among the Hindus, all of them have perception that people are not aware about COVID-19. It is found that there is a significant association between occupation and perception on people's awareness about COVID-19 at 1% level of significance where (p<0.002). Educational qualification is significantly associated with perception on people's awareness about COVID-19 at 10% level of significance (p<0.08). There is significant relation between age and perception on people's awareness about COVID-19 at 1% level of significance (p<0.001).

Table 3: Association between Perception on Aware About COVID-19 and Background Characteristics

Variable	Categories	Perception on Aware About COVID-19		Chi Square	P Value
		Yes	No		
Religion	Muslims	76 (20.2)	300 (79.8)	5.989	0.014
	Hindus	0 (0.0)	24 (100)		
Get Infected With COVID-19	Yes	4 (36.4)	7 (63.6)	2.216	0.137
	No	72 (18.5)	317 (81.5)		
Marital Status	Married	64 (19.8)	260 (80.2)	2.077	0.354
	Unmarried	12 (17.6)	56 (82.4)		
	Divorced	0 (0.0)	8 (100)		
Occupation	Government Jobs	0(0)	8(100)	22.93	0.002
	Private Jobs	4(6.3)	60(93.8)		
	Business	4(25)	12(75)		
	Shopkeeper	8(40)	12(60)		
	Housewife	36(18.2)	172(81.8)		
	Day Work	16(25)	48(75)		
	Rickshaw / Van Driver	8(40)	12(60)		
Educational Qualifications	Illiterate	36(22)	128(78)	6.756	0.08
	Primary	32(19.5)	132(80.5)		
	Secondary	8(16.7)	40(83.3)		
	Higher Secondary Or More	0(0)	24(100)		
Age	20-29 Year	24(12.8)	164(87.2)	15.97	0.001
	30-39 Year	24(18.8)	104(81.3)		
	40-49 Year	24(33.3)	48(66.7)		
	50 Year Or Above	4(33.3)	8(66.7)		
Number of Family Member	1 Member	0(0)	4(100)	4.712	0.194
	2-3 Member	12(13)	80(87)		
	4-5 Member	48(20)	192(80)		
	Above 5 Members	16(25)	48(75)		
Monthly Income	=< 10000 Taka	28(17.9)	128(82.1)	3.5	0.174
	11000-15000 Taka	36(17.6)	168(82.4)		
	Above 15000 Taka	12(30)	28(70)		

Discussion

This research examined the public's knowledge and the public can implement awareness of COVID-19-related health warnings, as well as the precautionary measures. Three-fifths (60%) of respondents and their family members are very aware and informed about COVID-19, whereas two-fifths (40%) are unaware. The finding is slightly inconsistent with another study, which showed that the majority of participants (89.6 %, 87.2 %, and 87.2 % respectively) had positive understanding, attitudes, and behaviors about the COVID-19 pandemic[12]. Around 32% of responders wear a mask while going outdoors during the corona period, while 25% use hand sanitizer. When existing research indicates that 93.8% of participants continue to use face masks while outside, other studies reflect a far lower figure of 27.7%[13,14,15,16]. This finding contrasts with previous studies indicating that fewer than 60% of individuals use a facemask when out in public[17-24]. Only 28% of study respondents reported sanitizing their hands, compared to previous studies showing that (92–96.6%) of individuals practiced hand hygiene on a daily basis [13,16,18, 25].

The study's findings indicate that more than a quarter (26%) of respondents travel less and 24% keep a safe distance while venturing outdoors during the corona period. Additionally, more than a quarter (27%) of respondent's attempts to wash their hands and faces with soap/hand wash during the corona time. The current findings are generally inconsistent with previous study that showed close contact avoidance (90.6%), hand washing (76.6%), face masking (66.6%), gloves (64.2%), and area disinfection (61.7%) as critical barriers to COVID-19 transmission[26]. In contrast to 97% of respondents in another study, they avoided touching their noses, 92.38% predicted covering their faces when sneezing, and 68 % chose to clean their hands if the soap was no longer useable. Additionally, 84% observed on-board

social distance and 77.3% wore masks[27].This study's findings indicate that three-fifths (91 percent) of respondents observed that people do not stay at their homes throughout the corona period due to financial problems. According to World Bank statistics, nearly 55% of urban residents live in slums[28]. In addition, the lowest segments of society, such as day workers, vendors, and rickshaw pullers, are forced to abandon social distance in order to survive[29].

Conclusions

Bangladesh is facing unavoidable difficulties during this pandemic era, with health safety and security being the primary concerns. The purpose of this study was to assess people's knowledge and awareness of health warnings related to COVID-19, as well as participant's Knowledge, Awareness, and Practice (KAP) of health warnings, the reasons for respondent's indifference to health warnings, and the association between perceptions of being aware of COVID-19 and background characteristics. As a result, it was determined that the usage of masks, hand sanitization, keeping social distance, and covering the face when coughing are critical health warnings and precautions for the public. However, the majority of individuals adheres to and retains these health warnings in their current lives throughout COVID-19. As a result, the research suggested that the responsible authority take more thorough and genuine measures by taking required steps and increasing awareness via seminars and campaigns. Without a doubt, the research results will serve as a guide for government officials and other organizations as they develop their policies and other preventative measures.

Ethical Approval

The BMRC's Dhaka Ethical Review Committee accepted the research protocol prior to the start of the project. [Approval Number: BMRC/RP/ Revenue/2019-20/607(6-98)] [Date: 29/06/2020].

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Ectopic Third Molar Associated With Dentigerous Cyst in Maxillary Sinus: A Case Report

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Abstract

Dental development is an interactive event between the oral epithelium and mesenchymal tissue. Any abnormal interaction at any step may result in ectopic teeth development.Teeth that are ectopically developed in non- dental areas has been reported in the nasal cavity, nasal septum, chin and maxillary sinus. Ectopic teeth in the maxillary sinus are asymptomatic in most cases;however it may precipitate sinusitis or sometimes result in ophthalmic symptoms.We report a case of ectopic maxillary third molar inthe right maxillary sinus with a non-specific symptoms which was enucleated out with the surrounding dentigerous cyst via a Caldwell-Luc procedure.

Keywords: *ectopic, eruption, maxillary sinus*

Introduction

Ectopic development or eruption of teeth or dental tissues within the dentate region is often seen in clinical practice, which are more common in mandible, and among females[1]. Incisors, canines and premolars are the most affected teeth[1, 2]. However such a condition in a non-dentate area like maxillary sinus is very rare[1-5]. Teeth that are ectopically developed in non- dental areas has been reported in the nasal cavity, nasal septum, chin, maxillary sinus, mandibular bone, mandibular condyle, coronoid process, palate, and orbital cavity[3]. Dental development is a multistep event in whichinteraction between the oral epithelium and the underlying mesenchymal tissue is essetial[4]. Any abnormal interaction at any step may result in ectopic tooth development and eruption[4]. Ectopic teeth in maxillary sinus are asymptomatic in most cases. However it may precipitate sinusitis or sometimes result in ophthalmic symptoms[3-5]. The condition may be undiagnosed for years until the patient undergoes radiographic examination for any reason[6].We report a case of an ectopic maxillary third molar in the right maxillary sinus with a non-specific symptom which was enucleated out with the surrounding dentigerous cyst via a Caldwell-Luc procedure.

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Case Report

A 23 years old female, referred to the oral and maxillofacial surgery department / Faculty of Dentistry-University of Zawia- Libya, from a general dental practitioner, complained of continuous dull pain in the right upper jaw area with a salty taste in her mouth since 6 months ago.Upon clinical examination no extra-oral or intra-oral relevant signs were detected apart from a dull vague mild pain upon pulpation of the maxillary right posterior vestibule with missing upper right wisdom tooth. Orthopantomograph (OPG) was ordered for the patient and revealed an ectopic molar tooth in the right maxillary sinus with radio opacity changes compared with the left maxillary sinus, (figure.1)

Figure 1: diagnostic Orthopantamogram reveals ectopic tooth no18 in maxillary sinus, and impacted teeth no 28, 38, 48.

Cone beam computer topography (CBCT) was performed to identify the accurate position of wisdom tooth in the right maxillary sinus, the tooth was detected in the superior medial region in the right maxillary sinus, contacting with lateral nasal wall and causing a slight deformity and thickening in the lateral nasal wall with narrowing and irregularities in the nasal airway. A cystic cavity was noted to surround the tooth,occupying about one half ofthe sinus.At the same time there was thickening of the sinus lining that nearly obliterate most of the sinus cavity which explains the symptoms of sinusitis that the patient is complaining of. The root of the wisdom tooth was incompletely formed with normal crown shape. (figure 2)
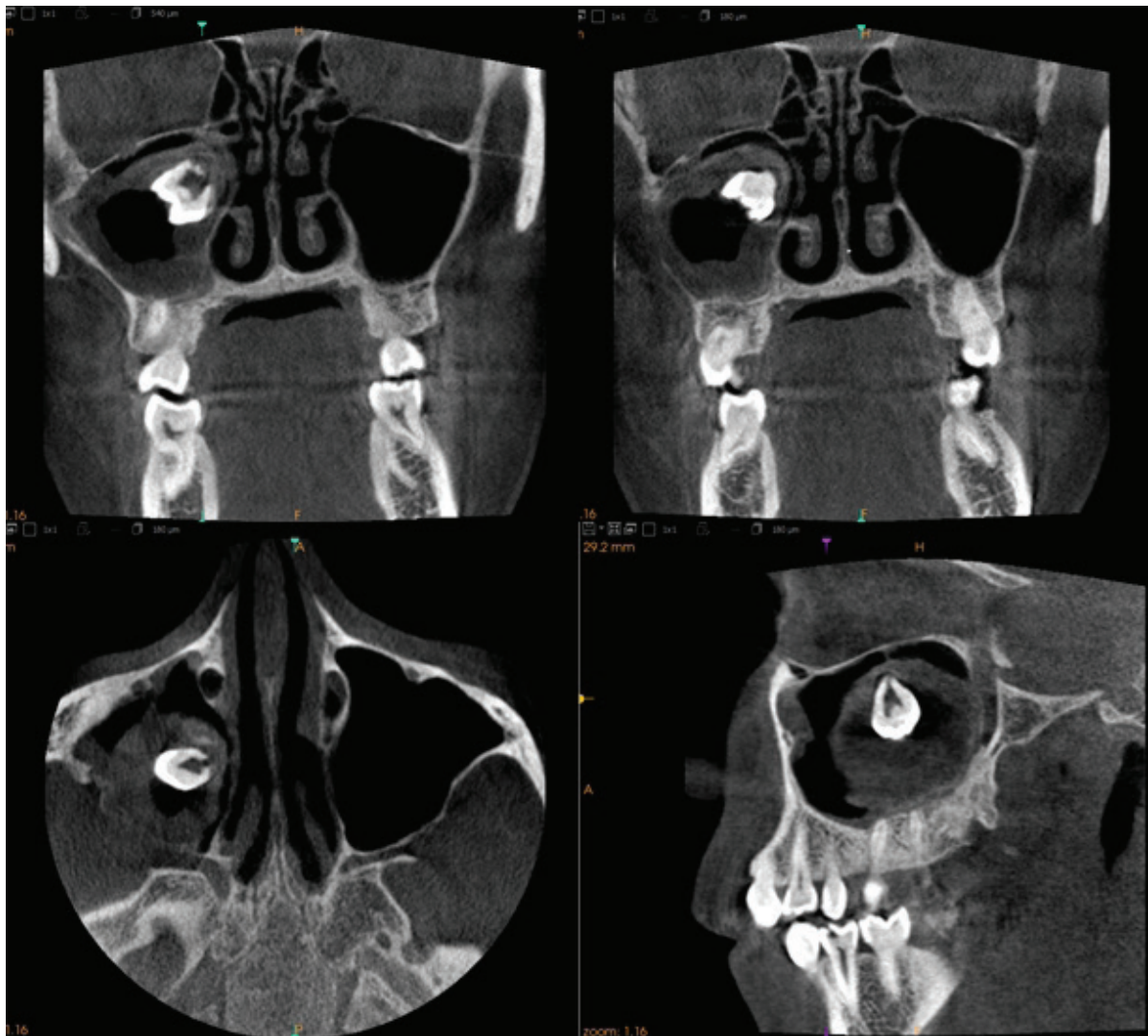
Figure 2: CBCT revealed an ectopic molar in the upper medial part of the maxillary sinus with cystic changes

The patient isadvised that surgical intervention is mandatory to remove the ectopic tooth and to enucleate the cystic lining. Subsequently, surgery was performed under general anesthesia with oral intubation via Caldwell-Luc procedure. A vestibular incision was made from the right lateral incisor to the right first molar tooth,a full mucoperiosteal flap was elevated to expose the anterolateral surface of the maxillary sinus. A bony window was created using a big round drill above the root apices of the maxillary posterior teeth, and the thick sinus lining was penetrated and the cystic lining with the ectopic tooth was enucleated out of the sinus by blunt dissection manouver. Hemostasis was achieved by placing pressure packs and electrocautery. Maxillaryantrostomy was performed and the drainage nasal tube was inserted. Finally the wound was closed with 3.0 vicryl suture.(figure 3)
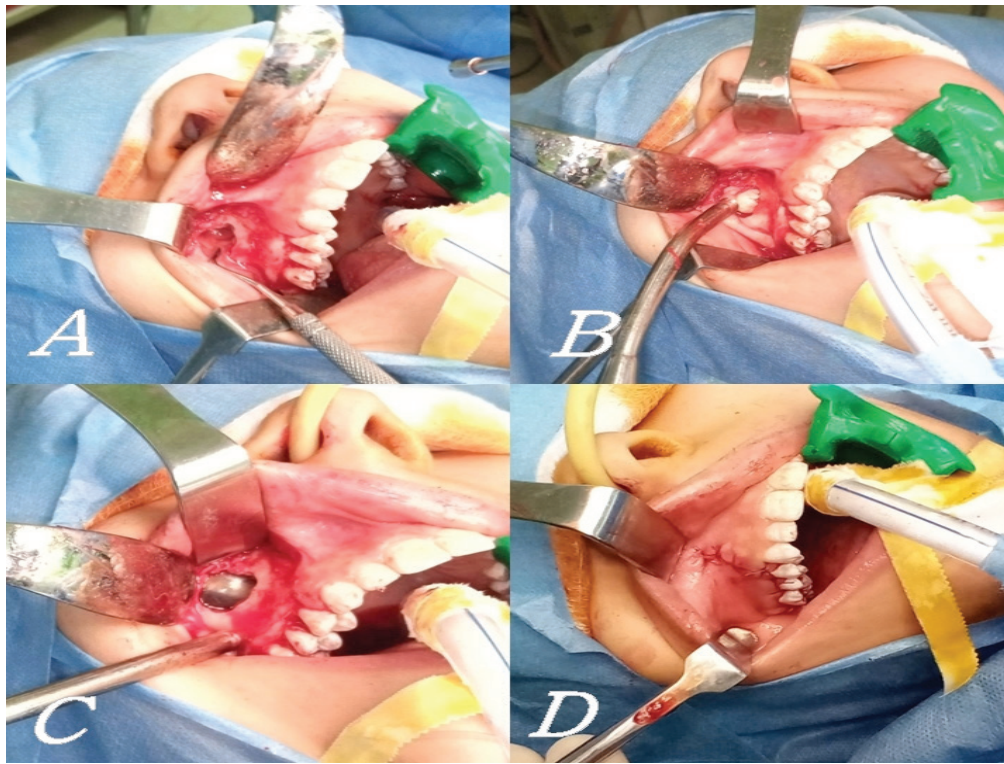
Figure 3: Caldwell-Luc procedure with nasal antrostomy for the right maxillary sinus

A Combination antibiotic regime of Augmentin 1gram twice daily and Flagyl 500mg 3 times daily were prescribed to the patient postoperatively along with Otrovine nasal drop and NSAIDS analgesics for one week. On the 10th day post operatively, swelling completely subsided. Histopathology of the soft tissue revealed a dentigerous cyst with no evidence of malignancy. There was no discharge from the nose. The patient has been asymptomatic over a one-year follow-up

Discussion

Any abnormal tissue interaction during odontogenesis may potentially result in ectopic tooth development and eruption[1,3]. The development of dentitions results from an interaction between the oral epithelial cells and the underlying mesenchymal tissue. This process starts with the formation of maxillary and mandibular dental lamina in the region of the future alveolarprocess in the 6th week *in utero*.

This dental lamina undergoes proliferative changes to form the permanent dentition between the 5th and 10th months[1-6].

The maxillary 3rd molar is the last tooth to erupt in the maxillary alveolar bone, so that it is more likely to be affected by displacement while competing for space in the dental arch, and this could be the possible causefor the high incidence of ectopic 3rd molar in the maxilla[7]. Beriat et al[8], in their review of ectopic teeth in maxillary sinus, reported 18 molars, ofwhich 17 were third molars, 5 canine, 3 supernumerary, 1 odontoma, 1 tooth-like structure, and only 1 premolar.

Most ectopic teeth are asymptomatic and may be discovered accidentally[3,4,9]. Many ectopic teeth in the maxillary sinus are asymptomatic and only discovered following routine radiography. On the other hand it may cause a wide variety of symptoms, includingsinonasal symptoms or ophthalmic symptoms. Some of these symptoms include a headache, facial pain, swelling,

nasal obstruction, nasal discharge, epiphora, rhinorrhea, hyposmia, and orbital proptosis[10]. In our case the symptoms wasnonspecificand the patient was only complaining of dull jaw pain and a salty taste. Dentigerous cyst is the most common of all dental follicular cysts. It always involves crown of impacted teeth[11]. Formation of a cystic lesion around an ectopic tooth may accelerate symptoms appearance[12]. Somayaji et al[13]. in the report of a tooth in the maxillary antrum reported nasal obstruction, discharge, and minimal fullness in right nasolabial area.Ectopic tooth eruption in maxillary sinus can be diagnosed radiographically by plain sinus radiographs, or by an orthopantomgraph (OPG). However after initial diagnosis CBCT is mandatory. It provides a three-dimensional evaluation of maxillary sinus with a lower patient dose of radiation compared with the traditional CT scan. It can reveal the exact location of the ectopic tooth in the maxillary sinus, the relation of the tooth with the sinus walls and the lesions associated with the impacted tooth with any possible cystic changes. Surgical intervention to enucleate an ectopic tooth in the maxillary sinus is usually mandatory, because if left untreated, it has the potential tendency to form a cyst or tumor and/or the lesion may cause perforation of the anterior sinus wall and the cheek area, or the orbital floor and obliteration of the nasal cavity[14]. Chronic sinusitis with its complication could be a consequence of neglected ectopic teeth in the maxillary sinus. The traditional surgical approach is Caldwell-Luc procedure, which allows a direct access into the maxillary sinus[8, 9, 12, and 14]. This approach was applied in the present case which allowed direct access to the tooth and the cystic lining as well as meticulous antral lavage. Endoscopic approach is being reported as another treatment option resulting in less morbidity[5]. However in this case due to the huge cystic lesion we preferred the traditional Caldwell-Luc procedure which allow direct wide exposure.

Conclusion

Ectopic erupted wisdom tooth in maxillary sinus is a rare case that needs surgical intervention to enucleate with any cystic lesion. Such cases may present with non-specific symptoms. CBCT is the best option to evaluate the tooth position and the sinus pathology in order to facilitate treatment.

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Dietary Habits, Food Consumption, Energy and Nutrients Intake of Adults of Selected Areas of Bangladesh

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Abstract

Purpose: Food consumption, energy and nutrients intake are the major concern now a days because they determine the nutritional well-being of a population. Hence, this study provide a clear picture of food consumption, energy and nutrients intake of adults of selected area of Bangladesh.

Design/methodology: It was a cross-sectional study conducted among 400 respondents from selected areas of Bangladesh.

Findings: The mean age of participants was 43.43±19.82 years. 58.75% of study participants were male where 41.25% were female. On an average, respondents consume rice (7±0) days/week. They consume other vegetables (6.95±0.27) days/week, fish (4.88±1.79) days/week, meat (0.83±1.07) days/week, leafy vegetable (2.57±1.81) days/week, pulses (1.98±1.78) days/week, milk and milk Product (1.8±2.75) days/week, sweet (1.66±1.92) days/week and oils (7±0) days/week. . About 57.5% of the respondents take more than 65% of total energy from carbohydrate, 37.5% of the respondents take less than 10% of total energy from protein sources and 24.75% of the respondents take less than 15% of total energy from fat.

54.75% of the respondents have "Highly Acceptable FCS", 23.25% of the respondents have "Low Acceptable FCS", 19.25% of the respondents have "Borderline FCS" and only 2.75% of the respondents have "Poor FCS". The per capita mean energy intake of Bangladeshi population was 2632kcal/day for male and 2249 kcal/day for female. Mean protein, carbohydrate, fat and fiber intake of the respondents were 56.7g/day,407g/day,30.9g/day and 34.7g/day respectively. Moreover, around 27% of the respondents are consuming less than 1805Kcal (* Hard Core Poor), 24.25% of the respondents are consuming 1805-2121 Kcal (**Absolute poor), 22% are consuming 2122-2600 Kcal and 26.75% of the respondents are consuming more than 2601Kcal.

Conclusion: Though the consumption of fruits, vegetables, meat, fish and milk product were increasing in the recent decades, this study results suggest the necessity of formulating policy and intervention strategies concentrating on the consumption of these food items in all levels in Bangladesh

Keywords: Dietary Habits, Food Consumption, Energy and Nutrients Intake

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Introduction

Due to inadequate access to adequate, healthy and nutritious food, the nutritional well-being of a significant portion of Bangladesh 's population is still

neglected. Since children and women belong to the most vulnerable group, they suffer from high levels of malnutrition and micronutrient deficiencies such as low birth weight (LBW), malnutrition (underweight, stunting and waste), vitamin A deficiency iron deficiency anaemia and iodine deficiency disorders ([1]). Several public health challenges in our nation arise over diet , obesity and related health issues ([2]). Throughout Bangladesh, the major component of the diet is cereal, mostly rice. Hence, this conventional diet is dominated by high cereal intakes which end up making the diet unbalanced. Household food consumption studies over the last 15 years have shown the consumption of cereal consumption declines, it still makes up the highest share (70 percent) of the diet, followed by non-leafy vegetables, roots, and tubers, that altogether comprise more than four-fifths of the rural people's total diet ([3]). In rural people 's diet protein and micronutrient-rich foods such as fish , meat, eggs , milk, milk products, fats and oils make up less than 10 per cent of total diet, and vegetable and fruit intake is steadily decreasing Rural consumption of leafy and non-leafy vegetables has persisted almost the same across the past two decades after increasing over the prior 30 years. The average Bangladeshi intake a total of 212g of fruits and vegetables daily, with an average national per capita intake of 31g of leafy vegetables, 136g of non-leafy vegetables and 45g of fruits .([4]). This is considerably below the amount of 400 g of fruits and vegetables recommended by FAO/WHO ([5]). As people consume less food than the recommended amounts, they suffer from energy deficiency which leads to under nutrition. The aims of this study, therefore, is to obtain dietary habits, food consumption, energy and nutrients intake of adults of selected areas of Bangladesh.

Methodology

Study Setting

The study was conducted in Dhaka, Mymensing, Sylhet and Khulna District in Bangladesh

Study Design, Period, and Sample Size

The study was a community-based cross-sectional study and it was conducted from January 01 to March 30, 2018. The study subjects were individuals aged 18 years and above and they were a permanent resident of the corresponding area. The sample size was 400.

Sampling Technique

This study was conducted among 400 adults aged 18 and above years who lived in Dhaka, Mymensing, Sylhet and Khulna District for more than six months before the survey. Here, multistage sampling technique was used. For the primary sampling units, four districts were randomly selected from a total of 8 districts. The sample size was equally distributed to each of the selected districts. Finally, a systematic random sampling technique was employed to select households for data collection. From the selected households sample were randomly selected.

Data Collection and Measurement

Data on demographic and behavioral characteristics were collected by trained personnel through a face-to-face interview using a semi structured questionnaire. The field study team was composed of enumerators and supervisors.

Dietary Habits:

7 days food frequency questionnaire (FFQ):

The frequency with which foods and/or food groups are eaten over a certain time period is measured by food frequency questionnaire (FFQ). Usually a close-ended food list and a frequency category section were included in the questionnaire that can be performed by respondents or interviewer.

Hour recall method: A 24-hour dietary recall is a dietary assessment tool which consists of a

standardized interview in which respondents are asked to report all the food and beverage they have consumed in the past 24 hours. In the study, respondents are asked to recall the foods and drinks they have intake in the previous 24 hours they also asked to provide more detail when necessary.

Food consumption Score (FCS)

The frequency of consumption of food items was measured using the food consumption score (FCS) which is a proxy measure to access food security and it was established by WFP [6]. As FCS is a well-defined measurement including standardized cut-off points, it has been used around regions and livelihood groups. It is a composite score based on food frequency, dietary diversity and relative nutritional importance of various food groups. The frequency of consumption of various food items over last seven days were asked to the respondents. Food items were grouped into 9 standard food groups with a maximum value of 7 days in a week. The frequency of consumption of each food group was multiplied by an assigned weight which relies on its nutrient content. The values were then summed up to obtain the total food consumption score. Then a comment was given depending upon the standardized threshold [7]. **The formula for calculating FCS is given below:** $FCS = a_{Staple} \times X_{Staple} + a_{pulse} \times X_{pulse} + a_{vegetable} \times X_{vegetable} + a_{fruit} \times X_{fruit} + a_{Meat \& fish} \times X_{Meat \& fish} + a_{Dairy} \times X_{dairy} + a_{Sugar} \times X_{Sugar} + a_{oil} \times X_{oil} + a_{condiments} \times X_{condiments}$

Where,

FCS = Food consumption score

a_1 **= weight of each food group**

x_1 **= frequency of food consumption (no of days for which each group was consumed during the past 7 days)**

Following the outlines, FCS for each household was calculated. The resulted score was used to categorize the household into four groups including poor consumption (0-28), borderline consumption (29-42), acceptable low food consumption (43-52) and acceptable high food consumption (>52). This classification was done for Bangladesh taking into account the importance of oil and fish in Bangladeshi population 's diet [8].

Dietary Diversity

Dietary diversity (DD) is universally recognized as a key component of high quality diets. Dietary factors are associated with increased risk of chronic disease and undernutrition and are therefore recommended by local and international dietary guidelines to help enhance dietary diversity. In most developed countries macro and micro-nutrient deficiencies are public health issues due to a monotonous, cereal-based diet that lacks diversity [9]. Moreover, diverse diet indicates the nutrient adequacy of the diet [10]. Several studies have also revealed that the overall nutritional quality of the diet can be improved with a diversified diet [11–13]. The dietary diversity questionnaire can be used to collect information either at the individual level or the household level. **The individual dietary diversity score includes a small number of food groups. These groups are:**

I. **Starchy staple,**

II. **Dark green leafy vegetable,**

III. **Other vitamin A rich fruits and vegetable,**

IV. **Other fruits and vegetable,**

V. **Organ meat,**

VI. **Meat and fish,**

VII. **Eggs,**

VIII. **Legumes, nuts, and seeds,**

IX. **Milk and milk products.** [7]

To calculate the individual dietary diversity first, the individual dietary diversity score is calculated for every respondent. hence, the score for each food group is either 1 or 0. To find out the individual dietary diversity score, the 9 food groups in the dietary diversity questionnaire are combined. The value of this variable will range from 0 to 9. Then the score is categorized into 3 groups. The dietary diversity score classification is:

Lowest dietary diversity (≤ 3 food groups).

Medium dietary diversity (4 and 5 food groups).

High dietary diversity (≥ 6 food groups). ([14])

Data Analysis

The data was entered, cleaned, and analyzed using the SPSS version 23.0 software package. Descriptive statistics and chi- square were used to describe the characteristics of study participants.

Consent to Participate

Informed verbal consent was assembled from each respondent. All information regarding this study was kept confidential.

Results

In this study a total of 400 valid respondents have been included. The mean age of study participants was 43.43±19.82 years. Two hundred forty-one (60.25%) of the participants were under the age of 50. Majority (58.75%) of the respondents was male and 41.25% were female. Most (56.75%) of study participants either attended primary education or did not attend formal education. Two thirds of them (68.5%) were married whereas 86 (21.5%) were single. About 35% adults were farmer whereas 22% were housewife (Table 1).

Table 1: Socio demographic characteristics of the study participants

Characteristics	Frequency	Percent
Sex		
Male	235	58.75
Female	165	41.25
Age		
18-35	115	28.75
36-50	126	31.5
51-65	74	18.5
66-93	85	21.25
Education		
HSC and above	101	13.5
SSC	119	29.75
Primary	154	38.5
No education	73	18.25
Marital status		
Married	274	68.5
Single	86	21.5
Divorced	23	5.75
Widowed	17	4.25
Districts		
Dhaka	100	25
Mymensing	100	25
Sylhet	100	25
Khulna	100	25
Occupation		
Housewife	88	22
Farmer	140	35
Private Job	72	18
Other†	100	25

Other†: including students (n=26), Unemployed (n=35), Businessman (n=18), and daily laborer (n=21).

Dietary Habits:

7 days Food Frequency:

Table-2: Distribution of Food items intake of last 7 days

Food Item	Mean	SD
Rice	7	0
Ruti	1.4	2.31
Leafy Veg.	2.57	1.81
Others Veg.	6.95	0.27
Fruits	0.64	1.11
Pulse	1.98	1.78
Fish	4.88	1.79
Meat	0.83	1.07
Egg	1.53	1.77
Milk	1.8	2.75
Sweet	1.66	1.92
Oils	7	0

Table-2 indicates that respondents consume rice on daily basis (7±0) days/week. They consume other vegetables (6.95±0.27) days/week, fish (4.88±1.79) days/week, meat (0.83±1.07) days/week leafy vegetable (2.57±1.81) days/week, pulses (1.98±1.78) days/week, milk and milk Product (1.8±2.75) days/week and sweet (1.66±1.92) days/week and oils (7±0) days/week.

Food Consumption Score:
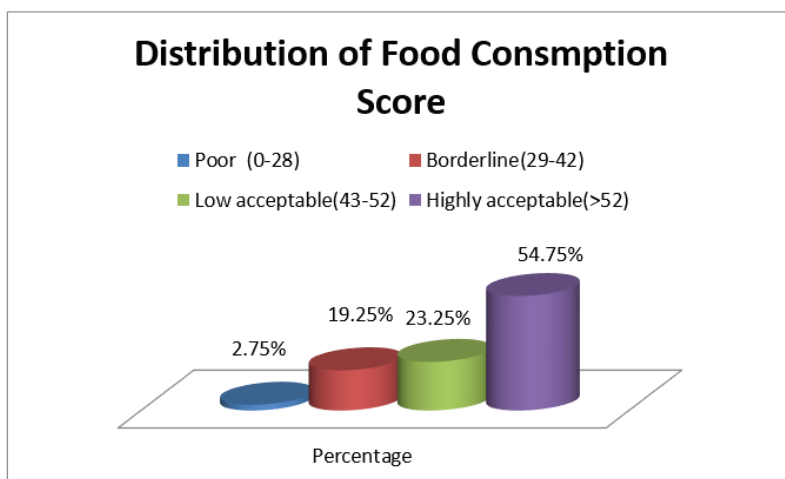
Figure-1: Distribution of Food Consumption Score

Figure-1 shows that 54.75% of the respondents have "Highly Acceptable FCS", 23.25% of the

respondents have "Low Acceptable FCS", 19.25% of the respondents have "Borderline FCS" and only 2.75% of the respondents have "Poor FCS".

Dietary Diversity:

Table-3: Distribution of Dietary diversity of the respondents (n=400)

Dietary Diversity	Frequency	Percentage
Lowest dietary diversity (≤ 3 food groups)	47	11.75%
Medium dietary diversity (4 and 5 food groups)	194	48.50%
High dietary diversity (≥ 6 food groups)	159	39.75%
Total	400	100%

About half of the respondents (48.5%) consumed medium dietary diversified food whereas 11.75% of the respondent consumed lowest dietary diversified food and 39.75% respondents consumed highly diversified food.

24 Hour Recall Method:

Distribution of Nutrients intake:

Table 4: Mean per capita energy, protein, carbohydrate, fat and fibre intake

	Energy(Kcal/day)	Protein (gm/day)	Carbohydrate (gm/day)	Fat(gm/day)	Fiber(gm/day)
Male	2632±732	58.6±14.5	437±113	29.6±19.1	37.75±12.7
Female	2249±648	55.8±11.6	357±109	33.3±11.6	36.7±13.3
Total	2398±528	56.7±16.5	407±119	30.9±19.7	34.7±9.8

The per capita mean energy intake of the respondents was 2398 kcal/day, protein intake was 56.7g/day , carbohydrate intake was 407g/day fat intake was 30.9g/day and fiber intake was 34.7g/day . The average energy intake of the male and female was 2632 kcal and 2249 kcal per person per day, respectively.

Distribution of Calorie Intake:

Table-5: Distribution of Calorie intake among Male and Female

Calorie Intake	Male	Female	Total	Chi-square Test	P-value
<1805Kcal*	16.75%(67)	10.25%(41)	27%(108)		
1805-2121 Kcal**	12.5%(50)	11.75%(47)	24.25%(97)		
2122-2600 Kcal	13%(52)	9%(36)	22%(88)	2.267	0.047
2601-3000Kcal	9%(36)	4%(16)	13%(52)		
>3000Kcal	7.5%(30)	6.25%(25)	13.75%(55)		
Total	58.75%(235)	41.25%(165)	100%(400)		

Table-5 shows that 27% of the respondents are consuming less than 1805Kcal (* Hard Core Poor), 24.25% of the respondents are consuming 1805-2121 Kcal (**Absolute poor) (15), 22% are consuming 2122-2600 Kcal and 26.75% of the respondents are consuming more than 2601Kcal. The calorie distribution between male and female is statistically significant (χ^2 (4) =2.267, p=.047).

Table 6: Distribution ranges of respondents-nutrient intake goals

Macronutrients	Carbohydrates			Protein			Fat		
Range of Intake(%)	<55	55-65	>65	<10	10 to 20	>20	>15	15 to 30	>30
Respondents(%)	15.75	41.75	57.5	37.5	41.25	21.25	24.75	61.5	13.75
Respondents(n)	63	167	230	150	165	85	99	246	55

Table 6 indicates that majority (57.5%) of the respondents take more than 65% of total energy from carbohydrate and 37.5% of the respondents take less than 10% of total energy from protein sources and 24.75% of the respondents take less than 15% of total energy from fat.

Table 7: Mean food intake (g/p/d) of the respondents

Food items	Intake (g/p/d)
Cereals	472
Pulses	15.3
Fishes	47.7
Poultry	15.25
Meat	6.7
Egg	6.25
Potatoes	89
Leafy Vegetables	41
Others Vegetables	151
Fruits	31
Oils	30.4
Milk	37
Spices	52
Sugar	13

It was found that total cereal intake was 472g/person/day. The intakes of fish, poultry, meat, egg, pulses, oils, fruits, potatoes, vegetables, milk and sugar (g/person/day) were 47.7, 15.25, 6.7, 6.25, 15.3, 30.4, 31, 89 , 192 , 37 and 13g ,respectively.

Discussion

Although extreme poverty rates are decreasing, according to the UN World Food Program (WFP), nearly 32 per cent of Bangladeshis still live below the national poverty line. About 25 percent of Bangladesh 's population still food insecure ([16]).

It was found that respondents consume rice on daily basis. It was established from other studies that largely rice, are the main food in Bangladesh ([4,17]). In another research it was found that total dietary energy was dominated by cereals in Bangladesh as against the internationally accepted value 54-55% for **developing countries** ([18]). As Bangladesh is producing more rice than before, the consumption is also increased

We have found that about half of the respondents (48.5%) consumed medium dietary diversified food whereas 11.75% of the respondent consumed lowest dietary diversified food and 39.75% respondents consumed highly diversified food. In another study from Bangladeshi student found out that while 10% of the respondents had consumed the least number of food groups, 4 % of the respondents consumed highest level of food groups ([19]). Another study from slum areas in Dhaka city Bangladesh have found out that approximately 61.3% of the adolescent girls consumed medium dietary diversified food and 30% of the respondent consumed lowest dietary diversified food where 8.7% girls enjoyed highly diversified food ([20]). As cereal products are mainly consumed , they try to neglect consumption of varieties of foods.

It was in this study that total cereal intake was 472g/person/day. The intakes of fish, poultry, meat, egg, pulses, oils, fruits, potatoes, vegetables, milk and sugar (g/person/day) were 47.7, 15.25, 6.7, 6.25, 15.3, 30.4, 31, 89 , 192 , 37 and 13g ,respectively. Researcher found in Northern part of Bangladesh the mean intake different food items such as cereals, potato, vegetables, pulses, meat and poultry, fish, milk and milk product, cooking oil, fruits, sugar and miscellaneous were 570.0, 115.0, 271.4, 8.6, 9.6, 36.9, 15.2, 11.2, 0.3, 2.0 and 12.8 g, respectively([21]). In other study it was found that with an average national per capita consumption of 23 g of leafy vegetables, 89 g of non-leafy vegetables and 14 g of fruit, the average Bangladeshi eats a total of 126 g of fruit and vegetables daily which is below the minimum daily consumption of 400 g of vegetables and fruit recommended by World Health Organization and FAO. ([22])

Average caloric intake among Bangladeshi population was 2632 and 2249 kcal/day among women and men, respectively which is slightly higher than the previous study where researcher found out that the caloric intake among Bangladeshi population was 2142 and 2394 kcal/day among women and men ([23]). The reason behind higher energy intake by study population may be due to the research is conducted in harvesting season.

Conclusions

Though residences of Bangladesh are now consuming more vegetables, fruits and animal products, the intakes should be more. Average consumption of energy in Bangladeshi population is approximately 280kcal less than the actual requirements. When the consumption is calculated on the basis of adult male equivalents, it is found that adult males are consuming sufficient energy although adult female are depriving a little bit. This study proposes a balanced diet with emphasis on fruits

vegetables, pulses, milk and other animal products consumption to fulfill the requirements.

Ethical Consideration: This study was approved by Ethical Review Board of University of Dhaka. The researchers clarified the objective of this research and obtained informed consent from the respondents.

Competing Interest: Authors declare to have no conflict of interest.

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A Study of Interpretation of Mantoux Test in Pediatrics age Group (5-18 Years of Age)

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Abstract

Objective: To establish the role of Mantoux test in diagnosis of tuberculosis in children.

Methods: The age group selected for this study was 5-18 years and period of study was Aug 2018 to Feb 2020.

Children attending to our OPD with the c/o fever & weight loss for > 2 months were advised to undergo Mantoux test along with CBC & ESR , CHEST X-RAY & Sputum Examination for AFB after taking detailed history including contact history of tuberculosis & clinical examination .

Result: Out of 100 cases 64 (64%) were to be found to be suffering from tuberculosis disease. Rest 36(36%) were improved with symptomatic treatment and antibiotic treatment.

According to age these children were divided into two group i.e,5-10 years and 10-18 years. It showed association between Mantoux test and tuberculosis was more in age group between 5-10 years in comparison to age group between 10- 18 years .

Conclusion: Childhood tuberculosis is an indirect index of the prevalence of tuberculosis in the community. Clinical presentation may be atypical and leads to delay in diagnosis. Children can present with TB at any age, but the majority of cases present with TB at any age, but the majority of cases present between 1 and 4 years. Disease usually develops within 1 year of infection- the younger, the earlier and the more disseminated. A positive tuberculin test does not indicate the presence or extent of tuberculosis; it only indicates infection. Mantoux has to be interpreted carefully. A careful history, complete physical exam, and focused laboratory evaluation are essential for determining the cause and initiating treatment. Occasionally A positive Mantoux test may be the only evidence of disease.

Keywords: *TU(Tuberculin Unit), TB(Tuberculosis), ATT(Anti Tubercular Treatment), Mx(Mantoux), AFB (Acid Fast Bacilli)*

Introduction

Tuberculosis remains a leading cause of morbidity and mortality in the world especially in the developing country. The tuberculin skin test is one of the few investigations dating from the nineteenth century that are still widely used as an important test in diagnosing tuberculosis. The present study was conducted upon 100 children to correlate interpretation of Mantoux test.Tuberculosis is caused by mycobacterium tuberculosis, an aerobic acid fast, non spore forming non motile slow growing bacillus. The actual global

disease burden of childhood tuberculosis is not known but it has been assumed that 22% of the actual tuberculosis case is found among children. A global estimate of 1.5 million new cases & 1,30,000 deaths due to tuberculosis among children is reported[1,2].

Objective:

This prospective study was conducted:

1. To establish the role of Mantoux test in diagnosis of tuberculosis in children.

Methodology

Mantoux Test was performed in all children who are attending to our outpatient and inpatient department.

A standard dose of 0.1 ml of 5TU (Tuberculin unit -PPD) was injected intradermally into the skin and read 48-72 hours later. We used 26or28gauge needle and tuberculin syringe from which 0.1ml was delivered accurately.

The age group selected for this study was 5-18 years and period of study was Aug 2018 to Feb 2020

Observation & Result

The Mantoux test does not measure immunity to TB but the degree of hypersensitivity to tuberculin, there is no correlation between the size of induration and likelihood of current active tb disease but the reaction size is correlated with the future risk of developing TB disease[6].

There is no correlation between the size of post vaccination Mx reaction and protection against TB diseases and routine post BCG Mx testing serves no purpose.

Materials & Methods

STUDY PROCEDURE: The Present study was conducted upon 100 children in whom Mantoux test was positive

(n=100). These children were coming to our OPD, Saraswathi institute of medical Sciences, pilkhuwa ,Hapur ,U.P children attending to our OPD with the c/o fever & weight loss for > 2 months were advised to undergo Mantoux test along with CBC & ESR , CHEST X-RAY & Sputum Examination for AFB after taking detailed history including contact history of tuberculosis & clinical examination .

Results

Out of 100 cases 64 (64%) were to be found to be suffering from tuberculosis disease. Rest 36(36%) were improved with symptomatic treatment and antibiotic treatment.

According to age these children were divided into two group i.e,5-10 years and 10-18 years. It showed association between Mantoux test and tuberculosis was more in age group between 5-10 years in comparison to age group between 10- 18 years

TABLE -1: Disease wise distribution of positive Mantoux test (n=100)

TUBERCULOSIS	64%
Disease relieved by symptomatic and antibiotic treatment	36%
TOTAL	100

Table -2: Distribution of cases according to age group

Age group	Total number of cases	Number of TB cases	% of TB cases
5- 10 years	60	48	80%
10- 18 years	40	28	70%
Total	100	76	

After 3 months follow up children who were taken antitubercular drug, become heathy and increase in weight and were advised to continue ATT till six months

Discussion

Mx test interpretation is difficult. It is neither sensitive nor specific with high false positive and false negative results. That is why in this study care was taken while performing Mantoux test. Diameter of induration was measured correctly. Regarding ATT, decision was taken considering all the factors together.

Wenli Pan, et al. in 2009 found that Mantoux test was positive in 430 children(28.4%) in their study. A positive culture, suggestive chest radiograph, and proximity of TB contact were risk factors for a positive test[4]. Henrik Aggerbeck, et al. study in 2013, showed the specificity of PPD was 63% using a cut-off of 15mm[5]. TB incidence in an adolescent cohort in South Africa; Hassan Mahomed,et al. noted in their study in 2013 a positive baseline TST was significant predictor of TB disease[6]. Rekha Bansal and Parveen K. Sharma mentioned in their article that Mantoux has to be interpreted carefully and one should also be aware of unusual presentations like Exaggerated Mantoux Reaction. Patient should be kept under observation.

Our study is similar when compared to the above studies. Among the total 41 cases of Mantoux positive , 16(39%) were found to be suffering from tuberculous disease and anti tuberculous drugs were started (table -1 and figure -1). According to age these cases were divided into 2 groups again i.e. 1 to 4 year and 5 to 12 year. Association betweenMantoux test and tuberculosis is more in the age group between 1 and 4 year and 5 to 12 year. Association Mantoux test and tuberculosis is more in the age group between 1 and 4 year when compared to the age group between 5 and 12 year(table -2, figure -2).

ATT was prescribed after considering all the deciding factors to start ATT like history of contact, clinical picture and other investigations(repeated investigations were done whenever required), opinion of faculty from other departments like radiology, pathology, microbiology. After 3 months follow up children who were under ATT, became healthy and increased in weight and were advised to continue ATT till 6 months. However, this study was conducted in children,who were attending to our hospital. Thus our findings may not represent the etiology of hypertension in the population.

Recommendations:

Making a diagnosis of tuberculosis in children is extremely challenging. A definite diagnosis of tuberculosis requires isolation of the organism from secretions or biopsy specimen. But a presumptive diagnosis of tuberculosis can be made from the following features.

· Positive tuberculin skin test(Mx test)

· Clinical and radiological features suggestive of tuberculosis

· Known contact with an adult case of TB

Although Mantoux test will be positive in latent TB infection, it is not specific. Detection of interferon – gamma (IFN-GAMMA) or T-cells producing interferon -gamma is employed for the diagnosis of latent TB infection or active disease.

· Quantiferon TB Gold test[8]

· T SPOT TB test

If the AFB smear is negative but clinical suspicion is high, nucleic acid amplification may be done.

· MTD (amplified M. tuberculosis direct test)[9]

· AMPLICOR system-amplification of characteristic fragment of bacillary DNA by PCR(polymerase chain reaction).

Conclusion

Childhood tuberculosis is an indirect index of the prevalence of tuberculosis in the community. Clinical presentation may be atypical and leads to delay in diagnosis. Children can present with TB at any age, but the majority of cases present with TB at any age, but the majority of cases present between 1 and 4 years. Disease usually develops within 1 year of infection-the younger, the earlier and the more disseminated. A positive tuberculin test does not indicate the presence or extent of tuberculosis; it only indicates infection. Mx has to be interpreted carefully. A careful history, complete physical exam, and focused laboratory evaluation are essential for determining the cause and initiating treatment. Occasionally A positive Mantoux test may be the only evidence of disease.

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Anthropometry Measures and Prevalence of Obesity among Undergraduates of Public University Libya

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Abstract

This research examines demographics, socioeconomic, eating habits, andphysical activity on obesity prevalence in students of Libya. The present study population consists of undergraduate students joining the universities of the west coast of Libya. Specifically, the research has been carried out with undergraduate students of two public universities (Zawia University and Sabaratha University) of Libya. The present study has used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student to collect from the questionnaire. This research has done a comprehensive theoretical discussion to be able to come up with the research hypotheses. The hypotheses were that there is a significant relationship between demographic factors and obesity prevalence in undergraduate students of Libya. Also, there is no significant relationship between socioeconomic factors and obesity prevalence in undergraduate students of Libya and. Furthermore, there is a significant difference between male and female undergraduate students in terms of eating habits. And finally, there is a significant difference between male and female undergraduate students in physical activity.Moreover, the study proposes the management take the initiative for the implementation of strategies that will be helpful to get the awareness about obesity among students in Libya.

Key Words: *Demographic factors, socioeconomic factors, eating habits, physical activity*

Introduction

Obesity is a medical disease characterized by the accumulation of extra body fat in the body [1]. Obesity is a complex, multidimensional chronic disease caused by the interplay of genetics and the environment. Obesity is caused by a mix of social, behavioural, instructional, cultural, physical, psychological, and

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metabolic factors and genetic factors (2). The growing prevalence of weight gain shows the impact of the diet's lifestyle on its aetiology[2-3].

The relationship between socioeconomic variables and obesity is complex, and various types of obesity are more prevalent in women than men and adolescents [4]. Obesity is increasingly common in both wealthy and impoverished nations. The high incidence of obesity is attributable to wide socioeconomic disparities[5]. The rates of overweight and obesity have been increasing, which makes most of its population vulnerable to the preventable chronic

diseases already mentioned [6]. What happens in a country declared in 2019 as one of the most inequitable in the world, where food insecurity is 42.7%, and the weight deficit in childhood reaches 13.2% [7]. The vast inequities that the country has without adequate intervention, in the long term, if it is not already affecting the health of Libyan, will deteriorate on a large scale due to the increased prevalence of diseases secondary to overweight and obesity.

Previous studies reporting risk factors and trends and the incidence of obesity in Libya focused on childhood. Moreover, there is a noticeable gap in current knowledge on the prevalence of obesity among undergraduate students in Libya. Therefore, this study will determine the prevalence of obesity in undergraduate students of Libya. The foundation for this is discussed below, along with a more detailed review of the literature.

Hypothesis Development

The Relation between demographic factors and obesity prevalence

Efforts to recognize the well-known increment in teenager obesity led to the problem of cause. Caloric imbalance resulted in overweight, and obesity expended for the number of calories consumed - and these were affected by several environmental factors, genetic and behavioral [7, 8].

The most important factors implicated with obesity were education, socioeconomic status, dietary alteration, physical inactivity, and fetal and child nutritional circumstances.

Bishwajit et al. [9] investigated the relationships between socioeconomic status (SES), physical activity, three types of sitting time (regular, weekend day, and leisure time sitting), and the potential mediation effects of sitting time and overweight or obesity. Gender, age, neighborhood socioeconomic (SES),

working hours, schooling, and physical activity were shown to be independently linked to routine, weekend day, and leisure-related sitting time. These sitting time factors were also related to being overweight or obese independently. Leisure time acted as a moderator in relationships with gender, income, and obesity.

Borgeraas et, al.,[10] investigated if obesity was more prevalent in the adult population, particularly among women with less education. Furthermore, obesity was more prevalent among impoverished individuals in well-established civilizations due to familial nutrition modifications than those in less developed countries.

The relationship between obesity and socioeconomic factors:

Bratke[11] investigate the connection between obesity and socioeconomic position (SEP) and find a strong relationship between obesity and SEP. High SEP is distinguished by education, wages, family resources, and house type. Obesity was discovered to grow with age. Obesity was also related to a high income and a poor education level[12]. Çelik[13] identified a link between area-level socioeconomic status and people who have poor eating habits and are inactive. AL-SEP disclosures included the unemployment rate, the percentage of adult residents with a high school diploma or less, and the monthly income of the family's guardian.

Champilomati[14] observed weight gain-related problems and threats. 1000 child aged between 6-11 years was screen out. The questionnaire was used to collect information. Statistical analysis indicated that viewing T.V. more than two h/day, physical exercise, and child order, and parent's obesity was related to the child's weight gain and obesity. Chung [15] analyzed body weight misunderstanding and eating behavior in Chinese adolescents. Total of 2641 students from school partaken in this experimental study. People

with a low degree of material prosperity and family income, on the other hand, were more likely to have a sedentary lifestyle [16].

The relationship between gender and eating habit

Dai et al. [17] investigated the relationship between take-out meal intake and obesity in Chinese university students. This poll included 1220 Chinese college students. Take-out food consumption may be influenced by significant category, preference for high fat-high sugar (HFHS) food, graduation, and BMI. According to the findings, excessive take-out meal intake increased the prevalence of obesity and the risk of metabolic disorders.

Libyan individuals (401 men and 265 females) aged 20 to 86 were taken to participate in the weight increase and obesity incidence study. Adults were randomly selected from the Benghazi election registration using a multistage sampling method. Anthropometric measures were taken using a body composition analyzer and a stadiometer. The findings revealed that 76.5 percent of people are overweight or obese (the prevalence of overweight in women was 33.2 percent compared to 32.4 percent in men, and 47.4 percent of women are obese compared to males).

Day et al., [18] investigated the links between obesity and food quality, dietary power density, and energy expenditures. Many health inequalities were linked to educational and economic inequality. Scarcity and food insecurity were also related to lower food expenditure, lower fruit and vegetable consumption, and poor-quality diets.

The relationship between gender and physical activity

Obesity in females has been related to mortality and significant morbidities, according to Yongwen Jiang, Reilly-Chammat, and Viner-Brown (2018). Kornet-

van der Aa, Mayer, Gómez et al., [19] investigated the prevalence and socio-spatial variations in obesity, individual and family circle traits, quality of living, and dietary habits obesity [20,21]. Hassan [22] investigated the relationships between BMI and waist circumference and obesity and physical activity categories. Physical activity ranging from moderate to vigorous included home activities, walks, exercise, and outdoor games and was categorized as inactive, insufficiently active, and appropriately active for anticipated health reimbursement and obesity prevention. Television and other screen-based leisure time were referred to as sedentary time (TVSL). The TVSL was directly related to waist circumference and BMI regardless of physical activity intensity ranging from moderate to high; walk and outdoor activities were inversely related to waist circumference, while the only walk was directly related to BMI.

Methodology

Questionnaire and Pre-test

Anthropometry is the science of measuring the human body in bone, muscles, and adipose (fat) tissue measurements. Subcutaneous adipose tissue measurements are significant because those with high levels are more likely to develop hypertension, adult-onset diabetes, cardiovascular disease, obesity, and other diseases [19]. The survey questionnaire used in the current research was developed from previous studies in which instruments have been tested for reliability and validity. The reliability and validity of the study were evaluated by Exploratory Factor Analysis EFA and Confirmatory Factor Analysis CFA.

Sample design and data collection

The present study population consists of undergraduate students joining the universities of the west coast of Libya. Specifically, the research will carry out with undergraduate students of two public universities (Zawia University and Sabaratha

University) of Libya. In selecting the participating students in this study, the samples will randomly be collected for present research from the west coast of Libya. For the data collection instruments, the present study will be used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student will be collected from the questionnaire.

Empirical Findings and DiscussiONS

This section produces the result obtained from the data analysis. This chapter is divided into four sections. The first section provides the profile respondents, while the rest three sections are specified for this study objectives.

The Relation between demographic factors and obesity prevalence

Table 1 shows that 500 respondents comprise the total sample of this study, 250 male and 250 female categorized into three groups of age ranged from 18 to 24. Most of the respondents belong to the age range between 20 and 21, where male composites the higher percentage of this age level by 124.
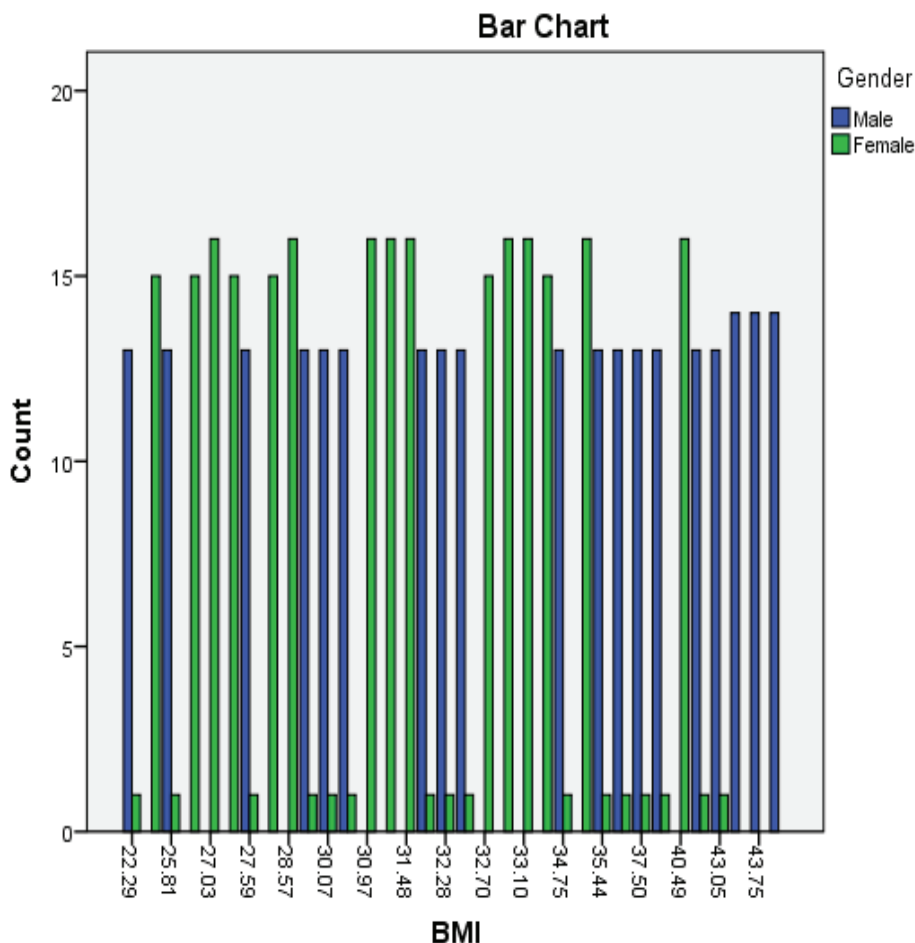
Figure 1: BMI * Gender

Figure 1 provides the descriptive statistics for the height, weight, and BMI of the female respondents. The minimum height for females was 1.41 cm, and the maximum 1.76, the mean of height 1.56 cm. For the weight, the minimum weight for females was 36 kg and the maximum 67, the mean of weight 48.6 kg. For the BMI, the minimum BMI for females was 22.29, and the maximum 43.05, the mean BMI 31.2. Based on that, there is overweight and obesity as the average BMI higher than 30. The descriptive statistics for the height, weight, and BMI of the male respondents. The minimum height for males was 1.41 cm, and the maximum 1.76, the mean of height 1.62 cm. For the weight, the minimum weight for males was 37 kg and the maximum 76, the mean of weight 56.3 kg. For the BMI, the minimum BMI for males was 22.29, and the maximum 44.71, the mean BMI 34.88. Thus, there is overweight and obesity as the average BMI higher than 30; also, the male students suffer an average higher risk of obesity than the female students.

The relationship between obesity and socioeconomic status

Table 1 provides the result of logistic regression based on the dependent factor than BMI as a measurement of obesity. The result obtained revealed that two determinants have a significant and positive impact on obesity: income level at (β=0.104, p=0.000), and Expenditure on food at (β=0.104, p=0.000), where more gaining income and Expenditure on food lead to obesity. Three determinants were found with a significant and negative prediction on obesity that gender, Physical activity, and Degrees of activity. The significant and negative estimation of gender reported at (β=-0.924, p=0.000), physical activity at (β=-0.027, p=0.015), and degrees of activity (β=-0.033, p=0.008). This result confirmed that gender plays a crucial factor in determining obesity. Also, low physical activity leads to an increase in the risk of overweight and obesity, the same for the degrees of activity, as low degrees of activity will higher risk of overweight and obesity.

Table1: Variables in the Logistic regression equation

		B	S.E.	Wald	df	Sig.
Step 1ª	Gender	-.924	.215	18.412	1	.000
	Age	-.051	.133	.145	1	.703
	Income	.104	.151	14.469	1	.000
	Expenditure on food	.201	.072	7.853	1	.005
	Living status	.207	.174	1.412	1	.235
	Physical activity	-.027	.115	9.055	1	.015
	Degrees of activity	-.033	.122	13.073	1	.008
	Leisure-time physical activity	-.025	.050	.254	1	.614
	Time in leisure time physical activity	.037	.101	.135	1	.714
	Constant	2.917	.632	21.274	1	.000

a. Variable(s) entered on step 1: Gender, Age, Income, Expenditureonfood, Livingstatus, Physicalactivity, Degreesofactivity, Leisuretime physical activity, Time inleisure time physicalactivity.

Eating habits/pattern for assessing the prevalence of obesity

To investigate the eating habits among undergraduate students to assess obesity, three categories of food habits are food groups, mealtime, and processed food items. Table 2 shows that most respondents have a higher percentage within the meat, fish, poultry, and eggs at 30%, where the male was 59.3% compared to 40.7% for female respondents. The fats, oils, and sweets food groups were followed by 26.4%, where the female respondents reported at 57.6% compared to male respondents consuming by 42.4%.

Table2: Food groups * Gender Cross tabulation

			Gender		Total
			Male	Female	
Food groups	Bread, cereals, rice, noodles, and other grains	Count	45	21	66
		% within Food groups	68.2%	31.8%	100.0%
		% within Gender	18.0%	8.4%	13.2%
	Milk and milk products	Count	30	20	50
		% within Food groups	60.0%	40.0%	100.0%
		% within Gender	12.0%	8.0%	10.0%
	Meat, fish, poultry, and eggs	Count	89	61	150
		% within Food groups	59.3%	40.7%	100.0%
		% within Gender	35.6%	24.4%	30.0%
	Vegetables, legumes, and pulses	Count	15	37	52
		% within Food groups	28.8%	71.2%	100.0%
		% within Gender	6.0%	14.8%	10.4%
	Fruits	Count	15	35	50
		% within Food groups	30.0%	70.0%	100.0%
		% within Gender	6.0%	14.0%	10.0%
	Fats, oils, and sweets	Count	56	76	132
		% within Food groups	42.4%	57.6%	100.0%
		% within Gender	22.4%	30.4%	26.4%
Total		Count	250	250	500
		% within Food groups	50.0%	50.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%

Table 3 provides processed food items, which categories into seven food items: baked foods, fried foods, junk foods, fast foods, artificially sweetened foods, soda and cola beverages and juices, and tea and coffee. The result found that most of the respondents were found with a high percentage of consuming fast foods by 32.8%, where the male respondents have the higher consumption of fast food by 54.9% and 45.1% for females. Followed by 22.8% of the respondents, followed by tea and coffee, the male respondents have the higher consumption of fast food by 52.6% and 47.4% for female.

Table3: Processed food item * Gender Cross tabulation

			Gender		Total
			Male	Female	
Processed food item	Baked foods	Count	13	23	36
		% within the Processed food item	36.1%	63.9%	100.0%
		% within Gender	5.2%	9.2%	7.2%
	Fried foods	Count	39	36	75
		% within the Processed food item	52.0%	48.0%	100.0%
		% within Gender	15.6%	14.4%	15.0%
	Junk foods	Count	0	11	11
		% within the Processed food item	0.0%	100.0%	100.0%
		% within Gender	0.0%	4.4%	2.2%
	Fast food	Count	90	74	164
		% within the Processed food item	54.9%	45.1%	100.0%
		% within Gender	36.0%	29.6%	32.8%
	Artificial Sweetened foods	Count	12	13	25
		% within the Processed food item	48.0%	52.0%	100.0%
		% within Gender	4.8%	5.2%	5.0%
	Soda and cola beverages and juices	Count	36	39	75
		% within the Processed food item	48.0%	52.0%	100.0%
		% within Gender	14.4%	15.6%	15.0%
	Tea and coffee	Count	60	54	114
		% within the Processed food item	52.6%	47.4%	100.0%
		% within Gender	24.0%	21.6%	22.8%
Total		Count	250	250	500
		% within the Processed food item	50.0%	50.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%

The independent sample t-test is conducted to test if there is a significant difference between male and female students regarding food groups, mealtime, and processed food item. Table 4 confirmed that there is a significant difference between male and female respondents in term of food groups, i.e., male (M=3.37, SD=1.74) and for female (M=3.37, SD=1.74) conditions; t (498) = -4.77, p=0.000), and for mealtime as for male (M=4.012, SD=0.773) and female (M=4.232, SD=0.622) conditions; t (498) = -3.503, p=0.001), while there is no significant difference found between male and female respondents in term of the processed food item.

Table4: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Food groups	Equal variances assumed	.179	.673	-4.765	498	.000	-.72000	.15110	-1.01688	-.42312
	Equal variances not assumed			-4.765	496.119	.000	-.72000	.15110	-1.01688	-.42312
Mealtime	Equal variances assumed	5.023	.025	-3.503	498	.001	-.22000	.06280	-.34339	-.09661
	Equal variances not assumed			-3.503	476.286	.001	-.22000	.06280	-.34340	-.09660
Processed food item	Equal variances assumed	.734	.392	1.065	498	.287	.18400	.17280	-.15551	.52351
	Equal variances not assumed			1.065	496.740	.287	.18400	.17280	-.15551	.52351

Practical Implementations

Obesity and sedentary behavior are well-known risk factors for the progression of cardiovascular disease. It is a critical sovereign translator of cardiovascular illness in both men and women, including cardiovascular disease, coronary mortality, and heart dysfunction [21]. Obese men and females had higher rates of cardiovascular risk factors (including angina, myocardial infarction, and heart disease or fondle) [22]. Obesity is the leading cause of high blood pressure, cardiovascular disease, diabetes, and mortality. Overweight and obesity are associated with increasing age, socioeconomic status, decreased physical activity and changing eating habits. Obesity and overweight are also associated with poor socioeconomic status and a lack of education [23]. This research indicates that obesity incidence is rapidly rising in Libya, suggesting that more effort is required for preventative and therapeutic measures to decrease the impact of this prevalent disease.

In Libya, the rates of overweight and obesity have been increasing, which makes most of its population vulnerable to the preventable chronic diseases already mentioned [24]. There is evidence in homes of the coexistence of excess and deficit of weight, called "double nutritional load," and deficiencies of various nutrients despite macronutrients and energy above the population recommendations. What happens in a country declared in 2019 as one of the most inequitable in the world, where food insecurity is 42.7%, and the weight deficit in childhood reaches 13.2% [20]. The vast inequities that the country has without adequate intervention, in the long term, if it is not already affecting the health of Libyan, was deteriorate on a large scale due to the increased prevalence of diseases secondary to overweight and obesity.

This research has done a comprehensive theoretical discussion to be able to come up with the research hypotheses. The hypotheses were that there is a significant relationship between demographic factors and obesity prevalence in undergraduate students of Libya. Finally, there is a substantial difference in physical activity between male and female undergraduate students. The present study has used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student to collect from the questionnaire.

Limitations and Future Recommendations

In addition to the limitations of any cross-sectional study, this research did not include other food groups such as meat or dairy. In this sense, future research could deepen this section with a complete nutritional analysis of these universities' populations. On the other hand, it was not possible to include the students in the last year of their studies due to the limited time available to them at that stage of their training and their geographic dispersion in multiple education sectors in the country.

Both for this university population and in future prevalence studies with a focus and areas of interest similar to those of this research, it would be advisable to delve into the analysis of alcoholic beverage consumption (types of alcohol, volume of each intake, frequency).

This research recommends carrying out strategies to promote physical activity in the Libyan public universities' population to prevent these future students from developing overweight obesity. One of the primary ways that colleges may utilize to have a good and direct effect on health is to educate students on health. This is one of the university's primary responsibilities. Proper nutrition and physical activity may be integrated throughout the semester's different topics and curricula, with an emphasis on teaching skills that aid in the acquisition of healthy habits and the maintenance of a healthy lifestyle. In addition,

customized plans for physical education courses are developed, considering students' requirements and their appropriateness to their skills and interests. Also, add passing or failing grades in physical training courses to pique the attention of both parents and kids.

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Anxiety Levels and Coping Mechanisms in People with Diabetes Mellitus During the Covid 19 Pandemic

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Abstract

Background: The psychological condition of diabetic patients affects blood glucose. Assessment of anxiety levels and coping mechanismsis important where diabetic patients are prone to psychosocial problems that affect glycemic control. **Objectives**: To analyze anxiety levels and coping mechanismsin diabetic mellitus patients during the COVID 19 pandemic. **Methods**: Descriptive methods of analytics with a cross sectional approach. Sampling with non probability sampling through purposive sampling in 66 diabetic patients at Idaman Banjarbaru Hospital. **Results**:The result of the analysis with p-value = 0.538 > 0.05, concluded Ho accepted. So there is no relationship between anxiety and coping mechanisms in diabetic mellitus patients during the COVID 19 pandemic. **Discussion**: Coping is considered a factor of a person's equilibrium in the adjustment of anxiety conditions. Coping manages the problems faced, with adaptive coping then a person succeeds in solving the problem that makes the level of anxiety decrease.

Keywords: diabetes mellitus, anxiety, coping mechanisms

Introduction

Non-communicable diseases are already a public health problem, both globally, regionally, nationally and locally. This causes non-communicable diseases to be the number one cause of death in the world (63.50%)[1]. One of the non-communicable diseases in the spotlight is diabetes mellitus. Diabetes mellitus is a metabolic disease that has a collection of symptoms due to increased blood glucose levels above normal values (hyperglycemia) due to a decrease in the body's ability to react with insulin, impaired insulin secretion, or both[2-4].

According to data states that in the age range of 20-79 years, the number of people with diabetes in the world in 2019 as many as 463 million people, and this number is projected to reach 578 million by 2030, and 700 million by 2045[5]. According to data for the prevalence of diabetes mellitus in the Southeast Asia region, in 2014 there were 96 million cases in 11 Southeast Asian member countries. It also showed an increase from 4,1% in the 1980s to 8,6% in 2014[2].

As for the prevalence of diabetes mellitus in Indonesia occupies the seventh position in the world as a country with the 2 highest incidence of diabetes

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mellitus with a total estimated sufferer of 10 million people[5]. The population data of diabetes mellitus in Indonesia increased from 2013 by 6.9% and increased until 2018 by 8,5%[6].

People with diabetes mellitus experience many changes in their lives, ranging from dietary regulation, exercise, blood sugar control, and others that must be done throughout their lives. Sudden life changes make people with diabetes mellitus show some negative psychological reactions including anger, feeling useless, increased anxiety and depression. In addition to these changes if people with diabetes mellitus have experienced complications it will add anxiety in sufferers because with complications will make sufferers spend more costs, negative views about the future, and others[7].

When the individual faces changes in his health status at that time the individual faces changes in cognitive balance and affective. Individuals can experience changes in relationships with others as a result of their expectations of themselves in a negative way. The appearance of tension and changes in balance result in problem-solving behavior or coping mechanisms appear in him to relieve tension by finding a way out of the problem or tension faced by the individual.

Research on coping mechanisms that most coping mechanisms of people with chronic Diabetes Mellitus are maladaptive coping mechanisms with factors related to the coping mechanism of patients[8]. Qualitative research on coping mechanisms in people with Diabetes Mellitus uses emotional coping mechanisms focused coping (self-control, accepting responsibility and taking positive meaning) and using coping mechanisms problem focused coping (social support and problem solving)[9].

At the end of 2019, a new type of coronavirus emerged, which was later named COVID-19.

Identified as the cause of pneumonia. It was first discovered in Wuhan City, Hubei Province, China. Its rapid spread even globally led the WHO to designate COVID 19 as a pandemic because it has infected more than 114 countries. Patients with diabetes mellitus have a higher level of risk than patients who do not have the disease. Although COVID 19 infection causes mild to moderate respiratory symptoms and will heal without special treatment, people who have a history of chronic diseases such as cardiovascular disease, diabetes mellitus, chronic respiratory disease, and cancer have the possibility to cause more serious symptoms and even death[10].

Psychosocial assessment of anxiety levels and coping mechanisms is very important because it is a nursing practice based on proof, where diabetic patients are susceptible to psychosocial problems that affect each other with glycemic control. Based on this phenomenon, prospective researchers examined the level of anxiety and coping mechanisms in people with diabetes mellitus during the COVID 19 pandemic.

Method

This type of research is descriptive analytical research using a cross sectional approach. The population in this study were all diabetic mellitus whose sampling was done by non probability sampling method through purposive sampling. Data collection in the form of primary data is done by filling out demographic data of sufferers and questionnaires. In this study the variables were described through univariate analysis which included demographic characteristics, anxiety levels and coping mechanisms of patients, as well as bivariate analysis tests using Chi square.

Results and Discussions

Characteristics of Respondents

Table 1. Characteristics of Respondents

Characteristics of Respondents	N	%
Age		
20-30 years	2	3,0
31-40 years	3	4,6
41-50 years	21	31,8
51-60 years	25	37,9
>60 years	15	22,7
Total	66	100,0
Gender		
Male	34	51,5
Female	32	48,5
Total	66	100,0
Education		
Primary school	12	18,2
Junior high school	11	16,7
Senior high school	27	40,9
Diploma	2	3,0
S1 (Bachelor)	13	19,7
S2 (Master)	1	1,5
Total	66	100,0
Profession		
Not working	27	40,9
Civil servant	13	19,7
Soldier	3	4,5
Police	3	4,5

Table 1. Characteristics of Respondents

Retired	41	6,1
Self-employed	15	22,7
Employee	1	1,5
Total	66	100,0
Long Suffering		
< 1 years	13	19,7
1-5 years	33	50
6-10 years	17	25,8
> 10 years	3	4,5
Total	66	100,0

Characteristics of the age of the majority of respondents aged 51-60 years, namely as many as 25 people (37.9%). The majority of these ranges are classified as elderly[11]. Degenerative factors are particularly associated in the decrease in insulin production by beta cells in the process of glucose metabolism that cause a person over the age of 46 years to have a high risk of diabetes mellitus[12]. In addition, the lack of sensitivity of pangkreas in producing insulin is also due to the factor of increasing age[13].

Characteristics of respondents based on gender in the results of the study of the majority of the male sex as many as 34 respondents (51,5%). Men have uncontrolled blood sugar control over women. Men pay less attention to a healthy lifestyle in an effort to control blood sugar levels in the body such as diet efforts, physical activity, or regular treatment[14]. However,women are more likely to have diabetes mellitus. This happens especially in the post-menopause. The hormones estrogen and progesterone that are in charge of increasing insulin sensitivity will decrease, so that insulin production activity will be reduced in the blood[15].

Characteristics of respondents based on the education of the highest majority of senior high school which is as many as 27 respondents (40,9%). Knowledge of health is more owned by a highly educated person than someone who is poorly educated. A person who has a higher education also has a higher awareness in living a healthy lifestyle, while in a low-educated person has a fairly low awareness in maintaining a healthy lifestyle in order to reduce the risk of developing a disease[16].

Characteristics of respondents based on the highest majority of jobs did not work, which was 27 respondents (40,9%). A person who does not work will have physical activity that is relatively mild, so the burning of energy in the body will decrease. The excess energy will be processed in the body into fat. Furthermore, metabolic and endocrine functions will undergo changes that make them easily obese. With a lot of fat buildup in the body causes a person to have

a high risk of developing diabetes mellitus because fat piles will inhibit the process of insulin production[17].

Characteristics of respondents related to long suffering obtained the highest majority of respondents, namely respondents did not know long they had diabetes mellitus as many as 31 respondents (47%). The majority of both respondents with a long suffering period of 1-5 years, namely as many as 23 respondents (34,8%). The longer a person has diabetes, the more experienced they are in controlling the disease, because they have long had the opportunity to learn about problems related to the disease they have[18].

Anxiety Levels in Diabetes Mellitus Patients During the COVID 19 Pandemic

Table 2. Anxiety Levels in Diabetes Mellitus Patients During the COVID 19 Pandemic

Anxiety Level	N	%
Anxious	45	68,2%
Not anxious	21	31,8%
Total	66	100%

The results of the study based on anxiety level variables were the highest majority of respondents who had anxiety as many as 45 respondents (68,2%). The results of this study are in line with who reported as many as 100% of respondents had anxiety[19].

The anxiety level of diabetic mellitus sufferers is related to the length of time the patient has diabetes mellitus. Based on the results of the study obtained the highest majority of respondents (47%) did not know long they had diabetes. A person who does not know or just know his illness will experience anxiety

about his illness. This is because people with diabetes mellitus must always regulate their lifestyle regularly which includes diet, physical activity, and taking medication, as well as other reasons diabetes mellitus is a disease that cannot be cured. This is what makes new sufferers experience anxiety for fear of not being able to meet a healthy lifestyle regularly, and lack of experience in new lifestyle adjustments.

Conversely, in someone who has long known if diabetes will have low anxiety, because they have experience in regulating their lifestyle, and have long undergone treatment of the disease that must be done, so they have begun to be able to adapt to the regulation of the disease rather than someone who does not know and only know the disease. In line with research that explains that a person's self-adaptation ability will increase if they have long lived life as a diabetic mellitus, so their anxiety levels are lower than someone who has long known to have diabetes mellitus[20].

Anxiety levels are also related to a person's level of education. Based on the results of the study obtained as many as 75,8% of respondents with education levels from elementary to senior high school. In line with the studyhad respondents with the level of respondents from elementary to senior high school as much as 83.3% resulting in as much as 86,7% of respondents who had anxiety[21]. The level of education affects the behavior that a person has. A person with a higher education is easier in his understanding in receiving information. With this high understanding, a person with higher education is easily adaptable in the acceptance and treatment of his disease. This makes the anxiety level of someone with higher education lower than someone with a low education[22].

Level of Coping Mechanism in Diabetes Mellitus Patients During the COVID 19 Pandemic

Table 3. Level of Coping Mechanism in
Diabetes Mellitus Patients During the COVID 19 Pandemic

Level of Coping Mechanism	N	%
Adaptive	64	97,0%
Maladaptive	2	3,0%
Total	66	100%

The results of the study based on the variable level of coping mechanisms are the majority with the most adaptive coping mechanisms as much as 97%. Effective mechanism strategies make a person easily adapt to the problems they face, but if the coping used is not effective it will have an impact on physical and mental disorders[23].

Coping mechanisms are influenced by the level of education. A person with a higher level of education has more knowledge and information in dealing with his illness, so they are more adaptable and solve problems to the disease they have[24]. But not everyone who has a higher education solves the problem with adaptive coping. A highly educated person also uses maladaptive coping in solving the problem. Conversely, a person who has a low education does not always use a maladaptive coping mechanism.A poorly educated person who solves his problem with an adaptive coping[25].

In this case, the coping mechanism is also affected by age and long suffering. The influence of age and long suffering will have an impact on the experience a person has[23]. With the older a person's age and followed by the length of time diabetes will be more experience has of the disease. Based on the experience of sufferers so that they have a lot of knowledge about the treatment of the disease.

Sufferers will try to adapt and live a life in accordance with a healthy lifestyle. Thus, the level of education is less influential in the process of coping mechanisms used. If the patient has a higher level of education but does not have much experience, then the sufferer does not necessarily always use adaptive coping mechanisms in living his life as a diabetic.

This is in accordance with the results of research obtained by the age of respondents as much as 60,6% aged 50-60 years and above who are classified as elderly. Respondents who are classified as elderly have lived a long life and get a lot of life experience during their lifetime. Plus based on the results of long-suffering research with diabetes, which is in the range of 1 year to more as much as 48,4%. The length of diabetes experienced by respondents is also related to the experience he had as a diabetic mellitus. With this experience, patients already have their own adjustment to the disease and lifestyle, so that respondents can deal with the disease with adaptive coping mechanism response.

Relationship of Anxiety and Coping Mechanisms in Diabetes Mellitus Patients During the COVID 19 Pandemic

Table 4. Relationship of Anxiety and Coping Mechanisms in Diabetes Mellitus Patients During the COVID 19 Pandemic

Anxiety Level	Coping Mechanisms				Total		P
	Adaptive		Mal Adaptive				
	N	%	N	%	N	%	
Not Anxious	20	95,2	1	4,8	21	100,0	0,538
Anxious	44	97,8	1	2,2	45	100,0	
Total	64	97,0	2	3,0	66	100,0	

Statistical test result with p-value = 0,538 > 0,05, which can be concluded that Ho is accepted. This means that there is no link between anxiety and coping mechanisms in patients with diabetes mellitus during the COVID 19 pandemic.

In contrast to the study mentions that there is a relationship between anxiety and coping mechanisms in diabetic patients (p-value = 0,002 < 0,05). The results were 12,5% with mild anxiety, 43,8% with moderate anxiety, and 43,8% with severe anxiety. Then based on the level of coping mechanism obtained as many as 62,5% of respondents with adaptive coping mechanisms[26].

Coping mechanisms are strategies that individuals use in dealing with changes in their lives, as well as a response to threats or dangers that cause physical and psychological damage. Anxiety is a feeling of insecurity and pleasure caused by fear, tension, and insecurity that pervade his mind[27].

When someone experiences a threatening situation, they will cause a fearful reaction. With excessive encouragement and accompanied by the inection of completing the stimulus will make an anxiety reaction in a person. So that with the condition of anxiety can be resolved through the arrangement of one's coping[28]. Maladaptive coping will make the risk of disease increase. A person's knowledge of the use of coping will make the coping response that everyone has varies.

The coping mechanism process exists that controls emotions in solving the problem and there are also those who face the problem directly or only focus on the problem. Problem solving is done dynamically based on the coping mechanism that a person has. Each individual with the other individual has a different coping behavior response to each other[29].

Anxiety levels are distinguished into mild, moderate, and severe anxiety. The anxiety of each individual has causes that underlie the onset of anxiety such as worrying about the development of the disease, worrying if the disease will not heal, worrying about not being able to maintain a healthy lifestyle in a sustainable manner, and anxiety about death. But in addition to these reactions, individuals

can also respond by frequently asking questions related to the problem of the disease even though previous questions have been answered, can not sleep (insomnia), restless, and not appetite[28].

Individuals who have inner calm in themselves will reduce the high level of anxiety. Inner calm can be done with the support of those closest to you such as family[29]. With the support of the family can give attention, advice, and positive encouragement to the individual, so that they can manage their anxiety emotions and able to follow the rules and procedures in controlling the disease. So that with low levels of anxiety will make the individual coping behavior response becomes good (adaptive) in solving the problem[28].

Individuals who have a maladaptive coping behavior response due to feelings that are not able to themselves, feelings of anxiety will not be able to solve a problem, there are feelings of fear, tension, weakness that affect a person's psychological that in the end will lead to reduced behavior in the fulfillment of needs in the management of disease and basic needs. Feelings arising from anxiety will make the individual use a maladaptive coping behavior response[30].

Coping is considered an equilibrium factor that manages a person in adjusting to stressful and anxiety conditions[23]. Coping creates a mechanism to manage the problems faced, with the adaptive coping of a person then one succeeds in solving his problems that make a person's psychological level including anxiety decrease, but if a person is not successful in solving the problem it will affect his psychological with increased anxiety[31].

Conclusions and Recommendations

Conclusions from the results of research related to anxiety levels and coping mechanisms in people with diabetes mellitus during the COVID 19 pandemic were obtained by respondents who had anxiety as many as 45 respondents (68,2%) and respondents with adaptive coping mechanisms as much as 97%. The results of statistical tests found no association between anxiety and coping mechanisms in patients with diabetes mellitus during the COVID 19 pandemic with a p-value of $0,538 > 0,05$.

The results of this study are expected to be literature on future studies such as research on factors that affect anxiety levels and coping mechanisms in diabetic patients. By knowing the level of anxiety and coping mechanisms so as to minimize psychosocial problems of patients that affect each other's glycemic control. This requires the role of health workers in reducing anxiety and improving the coping mechanisms of patients.

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The Association between Health Beliefs and Drug Use among the Elderly in Wiang Chai District, Chiang Rai Province

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Abstract

Background: Health beliefs of a person's influence their seeking for self-care, lifestyle, or health behavior for each individual subordinate many factors.

Objective: To study personal factors and health belief patterns associated with drug use among the elderly in Wiang Chai Sub-district, Wiang Chai District Chiang Rai

Methods: This cross-sectional study randomly selected the elderly sample group aged 60 years total 356 samples were selected from 923 elderlies based on the Taro Yamane sample size formula. Stratified Random Sampling from 4 villages out of 12 villages in Wiang Chai district Chiang Rai province.The data were statistically analyzed for percentage, standard deviation, while chi-square was analyzed for inferential statistics to examine the correlation between the health beliefs model and binary logistic regression for analysis demographic information and drug use among the elderly.

Results: The results showed that Elderly people had a score of health belief model at a very good level of 191 people (50.8 percent), and use drug was a very good level of 341 people (90.7 percent). The result found that association between the health belief model with drug use, age with drug use, status with drug use, and comorbidity with drug use of the elderly were a statistically significant correlation at the 0.05 level.

Conclusion: The results of this research can be applied for planning information and determining the guidelines for the adjustment of the elderly's drug use.

***Keywords:** Association, Health Beliefs, Drug Use, Elderly*

Introduction

Thailand is entering an aging society as the elderly population above 60 years is now higher than 10% of the total population judging by the criteria prescribed by the United Nations and the current global population structure trend[1]. Thailand's elderly population is quickly and consistently increasing from 6.8% in 1994 to 9.4%, 10.7%, and 12.0% in 2002, 2007, and 2011 respectively. A surveyin 2014revealed that Thailand had 14.9% elderly population (13.8% male and 1.1% female) or approximately 10 million people[2].In addition, the 2010 report indicated that Thailand showed 9% of the population aged 65 years and above. This ratio will increase to 14% in 2021 and 20% is expected in 2031. It is therefore

vital for the preparation of an elderly care support system. The 2013 report by the Office of Women's Affairs and Family Institute reported that Thailand comprises approximately 21.4 million families and most of which are nuclear families accounting for 52.3%, 34.5% extended families, 12.6% living alone, and 0.6% living with a non-relative. Nuclear families and single people are also increasing. Many elderly people are thus left alone and drug use problems in the elderly are detected frequently due to chronic illnesses among them. It was found that the use of various drugs among the elderly aged 70 years and above appeared to have side effects three times higher than those aged less than 50 years old[3].

Thailand Information Center 2016 report indicated that Wiang Chai District constituted a total population of 813 elderly people aged 60 years and above in Wiang Chai Sub-district showed a high number of using drugs instead of seeing the doctors due to physical and psychological constraints as well as financial burdens for their kids. In addition, caregivers tend to avoid taking the patients to see the doctor for follow-up and request a prescription of the same drugs. It was found that some cases take the same medicines for years without seeing the doctor. The researchers foresee the problems causing health problems and to study personal factors and health belief patterns associated with drug use among the elderly in Wiang Chai Sub-district, Wiang Chai District Chiang Rai.

Methodology

This cross-sectional study randomly selected the elderly sample group aged 60 years total 356 samples were selected from 923 elderlies based on the Taro Yamane sample size formula. Stratified Random Sampling from 4 villagesout of 12 villages in Wiang Chai district Chiang Rai province including Moo 2 Ban Rong Bua Loi, Moo 17 Ban Sri Wiang, Moo 7 Ban Dai Ku Kaew, and Moo 9 Ban Chainarai.

Sample group selection criteria:

1. Male or female aged 60 years and above

2. A resident of Moo 2 Ban Rong Bua Loi, Moo 17 Ban Sri Wiang, Moo 7 Ban Dai Ku Kaew, and Moo 9 Ban Chainarai for more than 1 year

3. Registered and listed on subsistence allowancerecipient in the area

4. Agree to participate in this research project

Criteria for screening out the sample:

1. Diagnosed brain-related illnesses such as dementia

2. Unable to communicate

3. Deny participation in the research project

Research Instruments

The research instrument was an interview-stimulating questionnaire consisting of 3 parts.

Part 1 Demographic Information: This part consists of 7 check-list questions i.e. gender, age, marital status, education, career, income, congenital disease.

Part 2 Health Belief Model: This 5-Likert scale questionnaire (usually, frequently, occasionally, sometimes, never) consists of 30 questions and covering 6 aspects i.e. (1) perception on the risk of disease (2) perception on chronic level of disease (3) perception on benefits (4) perception on obstacles (5) factors stimulating action (6) shared factors.

Part 3Medicine use among elderlies in Wiang Chai Subdistrict: This 5-Likert scale questionnaire consists of 18 items covering 6 aspects i.e. (1) Right Drug (2) Right Patient (3) Right Time (4) Right Route(5) Right Dose (6) Right Technique.

Instrument Validation

The researcher recruited 3 experts to evaluate the content validity and reliability of the questionnaire for the instrument validation process. The validity and reliability were at .05 and the questionnaire was revised and tried out with 40 samples holding identical characteristics with the population. The questionnaire also underwent item analysis and the Cronbach Alpha Coefficient scores were at .075.

Data Analysis

The data were statistically analyzed for percentage, standard deviation, while chi-square was analyzed for inferential statistics to examine the correlation between the health beliefs model and binary logistic regression for analysis demographic information and drug use among the elderly.

Results

The demographic information of 376 respondents was reported. Most of them were 212 females (56.4%), aged 60-70 years old accounting 235 respondents(62.5%), married accounting for 232 respondents (61.7%), primary education accounting for 154 respondents (41.0%), no career accounting for 159 respondents (42.3%), inadequate income accounting for 188 respondents (50.0%), no congenital disease accounting for 191 respondents (50.8%).

Table 1 showed that the health beliefs model, overall, were found implemented at a high level ($\overline{X}$ = 4.21; S.D. = 0.39). The individual aspects analysis showed that benefit perception was implemented at the moderate level ($\overline{X}$ = 3.37; S.D. = 0.46) followed by violence perception also at the moderate level ($\overline{X}$ = 3.63; S.D. = 0.33) respectively.

Table 1 Frequency, percentage, mean and standard deviation of the respondents answering the questionnaire on health belief model

Health Belief Model	Behavior						
	Never	Sometimes	Occasionally	Frequently	Usually	$\overline{X}$ (S.D.)	Meaning
1. Opportunity (Model 1)	0 (0.0)	1 (0.30)	37 (9.80)	320 (89.9)	18 (4.8)	4.38 (0.37)	High
2. Chronic Level (Model 2)	0 (0.0)	9 (2.4)	299 (79.5)	68 (18.1)	0 (0.0)	3.63 (0.33)	Moderate
3. Benefits (Model 3)	0 (0.0)	47 (12.5)	275 (73.1)	54 (14.4)	0 (0.0)	3.37 (0.46)	Moderate

Table 1 continuous

Health Belief Model	Behavior						
	Never	Sometimes	Occasionally	Frequently	Usually	$\overline{X}$ (S.D.)	Meaning
4. Obstacles (Model 4)	0 (0.0)	3 (0.8)	9 (2.5)	179 (47.5)	185 (49.2)	4.77 (0.34)	High
5. Actionstimulating Factors(Model 5)	1 (0.3)	1 (0.3)	4 (1.1)	276 (73.3)	94 (25.0)	4.64 (0.37)	High
6. Shared Factors (Model 6)	0 (0.0)	0 (0.0)	46 (12.2)	268 (71.3)	62 (16.5)	4.44 (0.44)	High
Total Mean						4.21 (0.39)	High

Table 2 showed that drug use among the elderly following the 6R Principle, overall, revealed implementation at the high level ($\overline{X}$ = 4.36; S.D. = 0.43). The individual aspects analysis showed that Right Route was found implemented at the moderate level ($\overline{X}$ = 3.42; S.D. = 0.63).

Table 2 Frequency, percentage, mean and standard deviation of the respondents on medicine use among the elderly following 6R Principle

Drug Use Principle (6R)	Behavior					$\overline{X}$ (S.D.)	Meaning
	Never	Sometimes	Occasionally	Frequently	Usually		
1. Right Drug	0 (0.0)	5 (1.4)	64 (17.0)	239 (63.5)	68 (18.1)	4.29 (0.58)	High
2. Right Patient	0 (0.0)	1 (0.3)	24 (6.4)	188 (49.9)	163 (43.4)	4.55 (0.53)	High
3. Right Time	5 (1.3)	12 (3.2)	128 (44.0)	173 (36.1)	58 (15.4)	3.92 (0.75)	High
4. Right Route	0 (0.0)	2 (0.5)	297 (79.1)	48 (12.7)	29 (7.7)	3.42 (0.63)	Moderate
5. Right Dose	0 (0.0)	0 (0.0)	1 (0.3)	4 (1.1)	371 (98.7)	4.99 (0.09)	High
6. Right Technique	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	376 (100.0)	5.00 (0.00)	High
Total Mean						4.36 (0.43)	High

Table 3 showed the correlation between the health belief model and drug use among the elderly following the 6R Principle. The Pearson Correlation indicated that violence perception showed the relationship with drug use at (r) 0.11 with the significance level of 0.03; correlation of benefit perception and drug use at (r) 0.23 with the significance level of 0.00; correlation of shared factors and drug use at (r) 0.29 with the significance level of 0.00 respectively.

Table 3 Pearson Correlation of health belief model and drug use among the elderly following 6R Principle

Variables	Coefficient (r)	P-Value
Opportunity and Drug Use	-0.048	0.35
Violence and Drug Use	0.11	0.03*
Benefits and Drug Use	0.23	0.00**
Obstacles and Drug Use	-0.01	0.87
Action-stimulating Factor and Drug Use	-0.04	0.48
Shared Factors & Drug Use	0.29	0.00**

* Correlation significance at .05 (2-tailed) ** Correlation significance at .01 (2-tailed)

Table 4 Binary logistic regression analysis of health belief model on drug use among the elderly following 6R Principle

Parameter	B	p-value	Odds ratio	95% C.I. for odds ratio	
				Lower	Upper
Model 2	0.03	0.69	1.03	0.89	1.18
Model 3	0.26	0.00	1.29	1.17	1.44
Model 6	0.26	0.00	1.30	1.16	1.45
Constant	-10.58	0.00	0.00		

Odd adjusted forModel 1, Model 2, Model 3, Model 4, Model 5, Model 6

The binary logistic regression analysis of the health belief model and drug use among the elderly indicated 6R Principle showed the relationship with benefit perception and drug use among the elderly was at an adjusted odds ratio (OR) 1.29, 95% C.I. 1.17 – 1.44, while shared factors and drug use among the elderly was at an adjusted odds ratio (OR) 1.30, 95% C.I. 1.16 – 1.45 as shown in Table 4.

Discussion

The health belief model, overall, was found implemented at the high level ($\overline{X}$ = 4.21; S.D. = 0.39) which corresponded to Amphonphan Khamsam (2015) in her study on Health Belief and Compliance Behavior with Prescribed Medication Among People with Hypertension at Thakham District Health Promoting Hospital, Mueang District, Phrae Province which indicated that, for individual aspects analysis, violence perception and risk on complications resulted from blood pressure against benefit perception and drug use were found at the high level[4]. This also concurred with Nattanun Kumpiriyapong and Siriphan Sasat (2017) in the study on Effect of Health Belief Programme on Medicine used Behavior in Older Persons with Hypertension[5] which revealed that mean scores of drug use among members of the experimental group after receiving health belief model training were higher than those of the pre-receiving health belief model training at the significance level of .05. Also, the mean scores of drug use among members of the experimental group receiving the health belief model were higher than those receiving normal nursing care programs at the significance level of .05.

The results of drug use among the elderly following the 6R principle, overall, revealed that implementation was found at the high level ($\overline{X}$= 4.36; S.D. = 0.43). The results agreed with Kanchana Panyathorn and Natthakul Beengmum (2019) in their study on Medication Use Behaviors in elderly patients with Chronic disease at Chomsri village, Udonthani Province[6] which revealed that drug use among the elderly, overall, showed appropriateness at a high level. The results showed that the elderly punctually see the doctor according to the appointment and inform about their drug allergy. This study also supported the study by Sasithorn Rungsawang (2018) in her study about Factors Related to Polypharmacy Medication Adherence among Older Persons with Chronic Illness[7] which reported that the sample group showed drug use at a high level ($\overline{X}$ = 29.32; S.D. = 3.07). The results also pointed out that risk

perception, violence perception, self-competence perception, and social support perception showed positive relationships with various drug use among the elderly with chronic diseases.

The correlation analysis between health belief model on chronic levels perception and drug use among the elderly following 6R Principle showed the correlation at (r) 0.11 with the significance level of 0.03; benefit perception showed the correlation with drug use among the elderly at (r) 0.23 with the significance level of .00; and shared factors showed the correlation with drug use among the elderly at (r) 0.29 with the confidence level of .00 respectively. The results agreed with Nattanun Kumpiriyapong and Siriphan Sasat (2018) in their study on The Effect of Health Belief Programme on Medicine used Behavior in Older Persons with Hypertension[5] The results revealed that: 1. The mean of medicine use behavior score, after participating in the health belief programme, was significantly higher than that before participating in the programme at the statistical level of .05 2. The mean of medicine use behavior score, after participating in the health belief programme in the experiment group, was significantly higher than the control group participating in the programme at the statistical level of .05 and consistent with Karakurt P and Kasikci M[8], recognition of barriers to appropriate behavior is important for the treatment of hypertension. In those who have high blood pressure and were treated with medication, it is necessary to have appropriate health behaviors. In addition to obtaining knowledge and practice manuals, the elderly with high blood pressure can remember. Understand things well. This awareness will drive older adults to avoid behaviors that pose a health risk by choosing the behavior that they think is the best option. By comparing the benefits from the appropriate behavioral practice and the obstacles or disadvantages that will occur if the inappropriate behavior results in consistent drug use behavior.

always and continuously

Conclusion

The health belief model and drug use among the elderly following the 6R Principle showed the chronic level perception, benefit perception, and shared factors revealed the relationship with drug use among the elderly. It is thus necessary that community hospitals should motivate the elderly to be aware of accurate drug use through promoting the implementation of the health belief model for sustainable health care promotion.

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Risk Factors and Prevalent of Sick Building Syndrome among Back-office Workers in a Thai University Hospital

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Abstract

Objective: To investigate risk factors and prevalent of sick building syndrome (SBS) among back-office workers in a Thai university hospital.

Methodology: This cross-sectional study was conducted among 165 back-office workers who always had been working in their office rooms not less than 3 months. Two anonymous self-administrated questionnaires collected data. Ten parameters of Indoor air quality were measured by air sampling. Multiple logistic regression was used to identify risk factors associated with SBS.

Result: The prevalence of SBS symptoms was 80% sample, followed by 68.5% with less specific symptoms and 41.8% suffering from poor concentration, with 40.6% experiencing similar prevalence in both groups of irritated, dry or watering eyes, and irritated, runny or blocked nose dry, and 26.7% sore throat. The result of the model shows that neuroticism, visual display terminal used, and allergy history were risk factors related to SBS (p-value <0.05).

Conclusion: Neuroticism, allergy history, and visual display terminal used were risk factors of SBS. These findings suggest that hospital administrators should be aware of neuroticism worker, allergic history, and visual display terminals used to prevent SBS symptoms among back-office worker who may leave their jobs due to aggravated symptoms and decreased productivity.

Keywords: Sick building syndrome, Back-office worker, Hospital, Allergy history, Neuroticism, Visual display terminal.

Introduction

Sick building syndrome (SBS) is an acute health effect experience of the occupants. It seems to link occupant spent time in the building that cannot identify as a specific cause or the symptom, different individual symptom experience in the same

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building [1]. The cause of SBS is usually directed to several factors that work in combination and build up to a point at which people within the area start to be physically affected [2]. Usually, the symptoms disappear or improve altogether when occupants left out the building and the symptoms often return when they re-entered the building [3]. Prevalent of SBS in hospitals

in Thailand was 24.62% up to 70.80% [4, 5]. SBS etiology was reported as occupational factors, working related to equipment like computer, carbonless paper,

photocopier, fax machine, printer, etc. [6-8]

Therefore, the investigators would like to study back-office workers who work in a hospital. While most studies concerns SBS have been conducted in cold climate countries, limited research in hot/humid climates. Air conditioners were used extensively in Thailand and mostly were split type. The air condition rooms usually had no ventilation. The literature on personality traits related to SBS was also limited in Thailand.

Methodology

A cross-sectional comparative study conducted on 165 back-office workers in a tertiary university hospital in Thailand who had been working for not less than 3 months and always works in their offices. The air conditioner system in their offices was a split-type system.

Questionnaire Survey: Two self- administered questionnaires collected independent variables and dependent variables. Work sensation and SBS symptom questionnaire included: Occupant characteristics contained gender, age, and allergy history; Work conditions explained work related equipment, working hours/week. Also, SBS symptoms were at least one symptom experience while workers spent time in the workplace and did not occur at home within 3 months. There were 5 symptom groups included; (I) irritated, dry or watering eyes (sometimes described as itching, tiredness, redness, burning or difficulty wearing contact lenses); (II) irritated, runny or blocked nose (sometimes described as congestion, nosebleeds, itchy, or stuffy nose); (III) dry or sore throat (sometimes described as irritation, upper airway irritation, or difficulty swallowing); (IV) dryness, itching or irritation of the skin, occasionally with a rash; (V) less specific symptoms such as headache, lethargy, irritability, and poor concentration [9]. The personality type questionnaire contained introversion/extroversion domain, and stability/neuroticism domain [10]. The personality type questionnaire classified personality type. This questionnaire consisted of 57 items to understanding personality of Eysenck's Personality Inventory (EPI). There were three scores, extrovert score (E score) and neurotic (N score) were out of 24. Lie score was out of 9 [10]. The questionnaires were prepared in English and translated into the Thai language. The content validity of instruments was conducted by an expert panel to review, edit, and double-check the questionnaire to ensure the validity of the initial and translation (IOC ≥0.5). Data collected in the questionnaires after obtaining ethical approval from the Human Research Ethics Committee of Thammasat University, No.3 (No.017/2020). Thai questionnaire, reliability was evaluated and calculated the Cronbach's alpha by SPSS. The acceptable value for each item was > 0.75. Data collection, workers self-reported 2 questionnaires and returned them to the investigator 1 week later.

Indoor Air Quality Assessment: Indoor air quality parameters were measured by sampling equipment. Eight parameters of IAQ, temperature, relative humidity, carbon dioxide, carbon monoxide, ozone, formaldehyde, volatile organic compounds, and particulate were recorded half an hour for four time slots [11]. Each slot recorded data every 5 minutes. The concentration level of each parameter was calculated from the average of 4 time slots. Mould and bacteria samples were collected 250 liters [12]. The mould was cultured in 2% Malt Extract Agar (MEA) and incubated for 5 days at 25°C. Bacteria were cultured in Tryptone Soya Agar (TSA) media and incubated by incubator for 2 days at 35-37°C. Bacteria and mold were counted every 24 hours after incubation for 18-24 hours [13]. Indoor air data were compared with Singapore Standard SS: 2009 [14].

Statistical analysis: After data collected and entry completed, categorical variables were presented as frequency and percentages, while mean and standard deviation presented continuous variables. The binary logistic regression was used to identify factors associated with SBS. Univariable model was performed to calculate the crude odds ratio (COR) with a corresponding 95% confidence interval. The potential risk factors associated with SBS in the univariable analysis with *p*-value <0.10 or clinically relevant factors were included into the multiple logistic regression using backward selection with 0.05 level of significance.

Result

Among the 18 back-office rooms in a tertiary university hospital in Thailand. Table 1 shows indoor air quality measurement result. More than 5% of the rooms were nonstandard IAQ parameters, temperature (11.1%), relative humidity (5.6%), formaldehyde (44.4%), and bacteria (33.3%).

Table 1 indoor air quality measurement result (n=18).

Indoor air quality parameters		Min	Max	Mean	SD	Nonstandard Number (%)	Standard Number (%)
Temperature (°C)		23.4	27.0	25.0	0.8	2 (11.1)	16 (88.9)
Relative humidity (%)		44.0	73.2	59.2	6.6	1 (5.6)	17 (94.4)
Carbon dioxide (ppm)		110	611	344.72	146.33	0 (0.0)	18 (100.0)
Carbon monoxide (ppm)		0.00	1.10	0.36	0.35	0 (0.0)	18 (100.0)
Ozone (ppm)		(belower than limit of detection)				0 (0.0)	18 (100.0)
Formaldehyde (ppm)		0.01	0.34	0.12	0.09	8 (44.4)	10 (55.6)
Volatile Organic Compounds (ppm)		0.88	1.65	1.11	0.18	0 (0.0)	18 (100.0)
Particles (mg/m3)	PM 2.5	2.30	14.90	6.48	3.42	0 (0.0)	18 (100.0)
	PM 10	7.30	39.80	19.96	8.76	0 (0.0)	18 (100.0)
Mould (cfu/m3)		35	305	123.6	67.3	0 (0.0)	18 (100.0)
Bacteria (cfu/m3)		170	1,325	455.0	289.1	6 (33.3)	12 (66.7)

Table 2 shows 5 groups SBS symptom prevalence. Most of the participants (80%) had experienced at least 1 symptom and 1 day per week. They had experienced at least one SBS symptom, included 1-3 day/week and ≥4 day/week. Most of them had experience SBS symptom 1-3 day/week in all symptom groups; (I) less specific symptoms such as headache, lethargy, irritability, and poor concentration (68.5%); (II) dryness; itching, or irritation of the skin, occasionally with a rash (41.8%); (III) irritated, dry or watering eyes (40.6%), (IV) irritated, runny, or blocked nose (40.6%); and (v) dry or sore throat (26.7%).

Table 2 Prevalence of sick building syndrome symptoms (n=165).

Sick Building Syndrome[a] (n=132, 80%)	1-3 day/week Number (%)	≥4 day/week Number (%)	Total Number (%)
Irritated, dry or watering eyes	53 (32.1)	14 (8.5)	67 (40.6)
Irritated, runny or blocked nose	59 (35.8)	8 (4.8)	67 (40.6)
Dry or sore throat	35 (21.2)	9 (5.5)	44 (26.7)
Dryness, itching or irritation of the skin, occasionally with a rash	57 (34.5)	12 (7.3)	69 (41.8)
Less specific symptoms such as headache, lethargy, irritability and poor concentration	95 (57.6)	18 (10.9)	113 (68.5)

[a] Able to select more than one answer

Table 3 shows the total of 165 workers (89.1% female) was included in this study. The mean (± SD) age was 36.10 ± 9.06 years. More than one-thirds (35.8%) of workers had a history of allergy. More than 70% used visual display terminal (VDT) (89.7%), photocopier (70.3%), and printer (90.3%) during their work. The distribution of personality type, introversion/extraversion domain, more than two-thirds of participants were introverts, and the rest were extroverts (69.1% and 30.9%, respectively). Stability/ neuroticism domain, more than a half of participants were stable, and the rest were neurotic. (57.6% and 42.4%, respectively). Workplace environment, nearly half of the participants worked in the nonstandard environment, temperature (3.6%), relative humidity (5.5%), formaldehyde (47.9), and bacteria (30.3%).

Table 3 Number and percentage of independent variable (n=165).

Variables			Number	%
Gender		Male	18	10.9
		Female	147	89.1
Age (years) (Min=22, Max=59, Mean=36.10, SD=9.064)		<30	51	30.9
		30-39	52	31.5
		>39	62	37.6
Allergy history		No	106	64.2
		Yes	59	35.8
Work related equipment	Carbonless paper	No	99	60.0
		Yes	66	40.0
	Visual display terminal	No	17	10.3
		Yes	148	89.7
	Photocopier	No	49	29.7
		Yes	116	70.3
	Fax machine	No	123	74.5
		Yes	42	25.5
	Printer	No	16	9.7
		Yes	149	90.3
Working hours/week (Min=30, Max=56,Mean=39.39, SD=5.829)		<36	79	47.9
		36-40	52	31.5
		>40	34	20.6
Personality types	Introversion/Extraversion domain	Introversion	114	69.1
		Extraversion	51	30.9
	Stability/Neuroticism domain	Stability	95	57.5
		Neuroticism	70	42.4
Indoor air quality	Temperature	Nonstandard	6	3.6
		Standard	159	96.4
	Relative humidity	Nonstandard	9	5.5
		Standard	156	94.5
	Formaldehyde	Nonstandard	79	47.9
		Standard	86	52.1
	Bacteria	Nonstandard	50	30.3
		Standard	115	69.7

Table 4 shows independent variable data and the relationship with SBS (n=165). The crude odds ratio (COR) of SBS with corresponding to 95% confidence level (95% CI) among workers with allergy history were 3.02 (95% CI: 1.17-7.81, *p*-value=0.023) compared to workers without allergy history, and worker who worked with visual display terminal (VDT) were also statistically significant (COR=3.28, 95% CI: 1.14-9.42, *p*-value=0.027). In addition, workers with neuroticism were 4.23 times more likely to be SBS than those with stability (95% CI: 1.64-10.93, *p*-value=0.002).

In the multivariate level, it was shown that allergy history, working with visual display terminal and neuroticism were independently associated with SBS (adjusted odds ratio [AOR]: 2.83; 95% CI: 1.05-7.59, AOR =3.42; 95% CI: 1.10-10.61, and AOR =4.40; 95% CI: 1.65-11.74, respectively) as shown in Table 5.

Table 4 The relationship of independent variables and SBS. (n=165).

Characteristics			Number	SBS		Crude OR (95% CI)	*p*-value
				n	%		
Gender	Male		18	13	72.2	1.00	0.386
	Female		147	119	81.0	1.64 (0.54-4.96)	
Age (years)	<30		51	40	78.4	1.06 (0.43-2.60)	0.601
	30-39		52	44	84.6	1.60 (0.61-4.19)	
	>39		62	48	77.4	1.00	
Allergy history	No		106	79	74.5	1.00	0.023 *
	Yes		59	53	89.8	3.02 (1.17-7.81)	
Work related equipment	Carbonless paper	No	99	77	77.8	1.00	0.384
		Yes	66	55	83.3	1.43 (0.64-3.19)	
	Visual display terminal	No	17	10	58.8	1.00	0.027 *
		Yes	148	122	82.4	3.28 (1.14-9.42)	
	Photocopier	No	49	39	79.6	1.00	0.932
		Yes	116	93	80.2	1.04 (0.45-2.38)	
	Fax machine	No	123	99	80.5	1.00	0.789
		Yes	42	33	78.6	0.89 (0.38-2.10)	
	Printer	No	16	11	68.8	1.00	0.243
		Yes	149	121	81.2	1.96 (0.63-6.11)	
Working hours/week	<36		79	63	79.7	1.00	0.985
	36-40		52	42	80.8	1.07 (0.44-2.57)	
	>40		34	27	79.4	0.98 (0.36-2.65)	
Personality types	Introversion/Extraversion domain	Introversion	114	92	80.7	1.15 (0.51-2.56)	0.736
		Extraversion	51	40	78.4	1.00	
	Stability/Neuroticism domain	Stabiltity	95	68	71.6	1.00	0.002 *
		Neuroticism	70	64	91.4	4.23 (1.64-10.93)	
Indoor air quality	Temperature	Nonstandard	6	4	66.7	1.00	0.415
		Standard	159	128	80.5	2.06 (0.36-11.79)	
	Relative humidity	Nonstandard	9	7	77.8	1.00	0.864
		Standard	156	125	80.1	1.15 (0.23-5.82)	
	Formaldehyde	Nonstandard	79	62	78.5	1.00	0.640
		Standard	86	70	81.4	1.20 (0.56-2.57)	
	Bacteria	Nonstandard	50	38	76.0	1.00	0.398
		Standard	115	94	81.7	1.41 (0.63-3.16)	

Table 5 Multivariate logistic regression analysis the factors related to SBS.

Factors		Adjusted OR (95% CI)	*p*-value
Stability/Neuroticism domain	Stability	1.00	0.003 *
	Neuroticism	4.40 (1.65-11.74)	
Visual display terminal	No	1.00	0.033 *
	Yes	3.42 (1.10-10.61)	
Allergy history	No	1.00	0.039 *
	Yes	2.83 (1.05-7.59)	

Discussion

The prevalence of SBS symptoms (80%) is higher than previous studies (24.62%-70.80%) [4, 5]. Etiology of SBS is difficult particular to identify, usually directed to several factors, work in combination and build up to a point at the people within the area start effects [2]. Allergy history related to SBS symptoms. The result was similar to the former study by Runeson et al. (2006) that SBS was associated with an allergy history [15]. The VDT had a statistically significant relationship with SBS. Consistent with previous research, VDT related to general symptoms, mucosal irritation, and eye irritation [8, 16]. SBS symptoms related to neuroticism. This finding supports previous study (Bobi et al., 2009) that reported neuroticism risk factors for SBS [17]. This study found not only three independent variables related to SBS, but also temperature, relative humidity, formaldehyde, and bacteria could contribute to SBS [7, 14, 18-20].

Neuroticism is a personality trait that contributed to sensory processing more sensitivity factors as a predictor of subjective health complaints [21]. Sensitive person has allergic reaction when they exposure to minor allergen [22]. Worker with an allergic history, pre-existing allergic symptoms occur during the period of high temperature [23]. Relative humidity can indirectly affect the incidence of allergies, relate to allergenic organisms such as viruses and bacteria [24, 25]. Exacerbations of allergic symptoms as well as with increased risk of allergy development have been associated with bacterial [26]. The usual sources of bacteria are building occupants, decomposed food, stagnant water, insects, bugs, pets, and condensation surfaces [14]. Formaldehyde is a sensitizer and irritant [27].

Prevention of SBS should reduced risk factors by cleaning and ventilation [28]. Cleaning and ventilation can improve the indoor environment. A major factor in preventing SBS is cleaning [25]. The two purposes of ventilation are to provide fresh air and to remove or dilute pollution [9]. Using the VDT was related to SBS symptoms [29]. Provide information and training to the worker can improve the quality of life in the workplace as ergonomic postures, comfort, and maintaining the level of lighting [30]. Also, they have to keep moving and take breaks [31].

Limitation of the study, most of the participants were more female than male (89.1% and 10.9%, respectively). Therefore, further evaluation of sex differences is needed using a larger number participants to confirm the findings.

Conclusion

As a result, neuroticism, allergy history, and visual display terminal used were risk factors for SBS. Possible risk factors elimination may decrease SBS prevalence. The hospital administrators should improve not only indoor environment but also

cleaning back-office rooms. Back-office workers should get information and training using the VDT, and understand SBS.

Ethical Clearance: Taken from the Human Research Ethics Committee of Thammasat University, No.3.

Source of Funding: Self

Conflict of Interest: Nil

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Burden of Diabetes in Rural Indiaand Its Association with Social Anddietary Factors

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Abstract

Background: Diabetes is a major public health challenge in the present phase of socio-demographic and epidemiological transition leading to various complications causing high mortality and morbidity. Diabetes is often not diagnosed in early phase especially in rural areas. This study was carried out to observe changing trends, prevalence of diabetes and its association with major risk factors in rural community.

Methods: A community based cross sectional study was carried out among 700 individuals (306 men and 394 women) aged 18-65 years living in villages under rural field practice area of Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation, Chinaoutpally, Krishna district, Andhra Pradesh. Information on socio-demographic data, dietary habits and life style was obtained. Height, weight,blood pressure and capillary blood glucose were measured.

Conclusion: The prevalence of diabetes is about 22.6% of the study subjects of whom 11.9% are known and 10.7% are newly diagnosed. The prevalence of Diabetes is increasing at an alarming rate even in rural population and nearly half of them aren't aware of their diabetes status. Diabetes when detected early can prevent lot of complications and improve the quality of life of the individual.

Key Words: *Cross Sectional Study, Diabetes, Hypertension, Non Communicable Diseases, Prevalence, Rural.*

Introduction

Diabetes, once considered as a mild disorder of the elderly has now become one of the major causes of morbidity and mortality affecting people of all age groups. Over the past decade it has been obvious that the prevalence of NCD's is increasing rapidly. Industrialization, urbanization, economic development, market globalization led to a change in diet and life style which had a significant impact on health and nutritional status of population, leading to the development of behavioral risk factors in the population.

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Diabetes mellitus is one of the non-communicable diseases which have become a major health problem with the prevalence rapidly rising all over the globe at an alarming rate, in both urban and rural areas, irrespective of socio-economic status.[1] It is important to note that the rise in prevalence is seen in all six inhabited continents of the globe. It was estimated in the year 2019, that 463 million people worldwide are diabetic of whom two thirds were living in the low and middle income countries.[2] If these trends continue, by 2030, 578 million people or nearly one in ten individuals will have diabetes, of whom 478 million people will reside in emerging economies compared with a mere 100 million in developed countries.[3,4] In 2015, as per ICMR INDIAB study, India has 62.4 million people with diabetes and 77.2 million people with pre-diabetes.[5] India currently has 77 million people with diabetes which in current phase could witness 101 million by 2030.[2] Diabetes mellitus is one of the leading causes of premature death worldwide along with other non-communicable diseases, e.g. cardiovascular diseases (CVD) and cancer.[6]

Objectives:

Ø   To determine the socio- demographic profile of the study participants.

Ø   To estimate the prevalence and to identify various risk factors for type 2 diabetes mellitus

Methodology

STUDY DESIGN:

This study was carried out as a **"community based cross- sectional study".**

STUDY AREA:

Rural field practice area of Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation, Chinnaoutpally, Andhra Pradesh covering 9 villages with a population of 31,420.

STUDY DURATION:

The study was conducted during May 2019 to February 2020.

STUDY POPULATION:

People aged between 18 years to 65 years, residing in the study area.

Inclusion criteria:

1) Individuals aged >18 years to <65 years residing in the identified unit of study (household)

2) People willing to participate in the study and get their Fasting Blood Sugar (FBS) done.

Exclusion criteria:

1) Individuals aged <18 years and >65 years

2) Pregnant women

3) Previously diagnosed with conditions that causes secondary diabetes.

(eg.: Polycystic ovarian disease(PCOD), Acromegaly, Phaeochromocytoma, Adenocarcinoma, Cushing's syndrome, hemochromatosis, pancreatitis, cystic fibrosis, etc)

4) Mentally challenged

5) Sick individuals (Infections).

6) People not present at the time of visit.

ESTIMATION OF SAMPLE SIZE:

As per studies conducted in Andhra Pradesh to know the prevalence of diabetes mellitus, the prevalence of diabetes in Godavari is 13.2%.[7]

The above data reflects the prevalence of diabetes in rural communities of Andhra Pradesh.

Sample size was calculated using the formula, $n=4pq/L^2$.[8]

p= 13.2%

q = 86.8 (i.e., 100 - p)

L = 20% (allowable error)

The sample size comes to **657**, and it was rounded to 700 considering non responders.

SAMPLING TECHNIQUE:

The sample to be studied from each village is done by Probability Proportion to Size (PPS) method. The first house is selected by lottery method and then onwards each house is selected by systematic random sampling until the desired sample is reached in each village.

Procedure methodology

After obtaining informed oral consent from the study subject, a pre tested and semi structured questionnaire was used to record data. The questionnaire included socio-demographic characteristics such as age, gender, occupation, socio economic status, marital status, literacy status, height, weight, physical activity, food habits, lifestyle habits like smoking and alcohol and family history of Diabetes. Height and weight were recorded using standardized methods.[9]Socio-economic status was classified using modified B.G. Prasad scale 2019. BMI was calculated using quetelet index. Blood pressure was recorded in the sitting position in the left upper arm using the electronic OMRON-HEM 7120 machine (Omron Corporation, Tokyo, Japan). The study subject was asked to sit quietly and rest for 15 minutes with his/her legs uncrossed and three readings were taken with a minimum interval of 3 minutes and the mean of the second and third reading was taken as the blood pressure and are classified basing on JNC VII criteria.[10,11]The study participants were asked to be on fasting at least for a period of 8 hours before the testing was done. The FBS was estimated by taking capillary blood using a glucometer [12](One Touch Ultra, Lifescan, Johnson & Johnson, Milpitas, CA).

Ethical issues

Ethical clearance was obtained from the institutional ethical committee prior to the start of study. Written informed consent was obtained after explaining the importance of the study in detail. Questionnaire does nothave any identification details of the participant and confidentiality was maintained throughout the study.

Statistical analysis

Data entry and statistical analysis was done using SPSS v 16 (trial version). The results were explained in simple proportions. Difference between groups was assessed using chi square test for their statistical significance. P value less than 0.05 was considered significant.

Results & Discussion

The mean (SD) age of the study population was 40.35 +13.309 years. The prevalence of diabetes is about 22.6% of the study subjects of whom 11.9% are known and 10.7% are newly diagnosed. (Table 1)The results were closely related to the findings of Asraret. al., [13] Menon et. al., [14] Gupta et. al., [15] and Ramchandranet. al., [16]The prevalence was a little higher compared with the findings of Prabakaran et. al., [17] , Mohan et.al., [18] and Anjana et.al., [19]. The high prevalence of diabetes in the study area could be attributed to cultivation of commercial crops and industrialization of the area. The mean BMI for male participants in the study was 23.78+4.63 and for female participants was 24.25+5.23.The study observed an overall prevalence of hypertension to be 28.71% (201).Gender wise distribution of the population in the study is such that 306 (43.6%) being males and 394 (56.4%) being females. Majority of the study participants were Hindus ie; 63% , followed by Christians 25.1% and Muslims 11.9%. Majority of the

study participants were married ie; 80.3% of them. 10.1% of the participants were widowed and 0.9% of the participants were separated. 8.7% were unmarried study participants. 43.7% of the widowed, turned out to be diabetic.24.3% of the study population constitute farmers and 17.9% of the participants were daily laborers working in farms or industries. 35% of the participants constitute house wives, dependents and unemployed. 8.4% of the participants were employees and 4.4% of the participants were into business. Whereas rest of the 10% of the participants are into their familial occupations.The risk of diabetes is highly significant with increasing age, occupation, socio economic status, marital status and literacy status of the study subjects.(Table 2)The prevalence of diabetes was observed to be reducing with increase in educational standards. This could be due to increase in awareness about the risk factors in the educated persons. The risk of type 2 diabetes is almost nil in young individuals who are unmarried. Whereas the risk is very high for diabetes in unemployed, house makers and dependents who are leading a sedentary life. Risk is also observed to be almost nil in class 5 socio economic status individuals.(Table 2)The prevalence of diabetes was significantly low in high socio economic groups and this finding is in contrast to all the studies. This could be due to low sample size of class V socio economic group. The relation between diabetes and socio economic status has showed high statistical significance in the study. Only 17.3% of the study participants are smokers. Females in the study area do not smoke whereas 1% of them are passive smokers. Only men in the study participants smoke (121 out of 306) ie; almost 39.5% of the men have the habit of tobacco usage. 11.7% of the total study participants are alcoholics. Only men

in the study area consume alcohol (82 out of 306) ie; 27% of the men. 35.4% of the study subjects had the habit of daily consumption of coffee.Majority of the study participants (39.9%) have moderate physical activity at home and work, while 38% of the participants have mild physical activity at home and work and 6.2% of the participants have vigorous physical activity. 15.9% of the study participants were leading a sedentary life style.All the study participants have the habit of consuming vegetables daily in their diet. 94.7% of the study participants take mixed diet, whereas 5.3% of them are strict vegetarians. 32.3% of the study participants have the habit of including at least one fruit in their daily meal and 27.1% of the study participants consume a fruit at least once in a week, whereas the rest 40.6% of the study participants consume fruits occasionally.68.1% of the study participants do not have any family history of D.M, whereas 14% of these presented with diabetes. 17.1% of the study participants had at least one diabetic parent and of these 29.2% presented with diabetes. 3.5% of the study participants had both diabetic parents and of these 70.8% presented with diabetes. 9% of the study participants had diabetic siblings and of these 47.6% of them presented with diabetes, 2.3% of the study participants had either/both parents and siblings with diabetes and of these 56.2% presented with diabetes. There was significant association between diabetes and coffee consumption, fruit consumption, obesity, waist circumference, increasing age, physical inactivity, family history and status of hypertension which is almost similar in all the above studies. The relation between diet, life style, family history and status of diabetes among study participants is shown in Table 3.

Table 1: Status of Diabetes Mellitus in study subjects

STATUS OF DM	No. OF SUBJECTS	PERCENTAGE
Normal	542	77.4
Known DM	83	11.9
Newly Diagnosed DM	75	10.7
TOTAL	700	100.0

TABLE 2: Socio demographic profile of the study participant's v/s status of DM

	FBS			Chi-Square value	P-value
	Normal	IFG	DM		
Age	%	%	%		
18-24	93.50%	6.50%	0%	174	<0.01
25-34	66.40%	18.10%	15.40%		
35-44	50.30%	23.30%	26.40%		
45-54	36.00%	21.60%	42.40%		
55-65	29.30%	22.00%	48.80%		
Sex					
Male	64.40%	13.10%	22.50%	7.21	0.027
Female	56.90%	20.60%	22.60%		
Occupation					
Unemployed/HouseMaker/Dependant	42.90%	23.30%	33.90%	67.37	<0.01
Daily Laborer	67.20%	24.00%	8.80%		
Farmer	69.40%	10.00%	20.60%		
Employee	72.90%	6.80%	20.30%		
Business	58.10%	22.60%	19.40%		
Others	75.70%	8.60%	15.70%		
Socio Economic Status					
Class 1	51.00%	17.20%	31.70%	21.91	<0.01
Class 2	57.70%	18.70%	23.70%		
Class 3	64.50%	19.50%	16.00%		
Class 4	69.60%	7.60%	22.80%		
Class 5	100.00%	0%	0%		
Marital Status					

TABLE 2: Socio demographic profile of the study participant's v/s status of DM

Unmarried	96.70%	3.30%	0%		
Married	60.50%	17.10%	22.40%	70.42	<0.01
Divorced	66.70%	16.70%	16.70%		
Widowed	25.40%	31.00%	43.70%		
Literacy Status					
Illiterate	53.80%	21.80%	24.40%		
Primary	55.90%	17.10%	27.10%		
Secondary	63.50%	15.70%	20.80%	22.87	0.01
Higher Secondary	62.50%	14.30%	23.20%		
Graduate	77.60%	12.10%	10.30%		
Post Graduate	89.50%	0%	10.50%		
Total	60.10%	17.30%	22.60%		

Table 3: Dietary Habits, Lifestyle, Family history v/s Status of DM

	FBS			Chi-Square value	
Habit Of Tobacco Usage	**Normal**	**IFG**	**DM**		
	%	**%**	**%**		
Yes	57.90%	17.40%	24.80%		
No	60.70%	17.50%	21.90%	3.04	0.55
Passive Smoking	57.10%	0%	42.90%		
Habit Of Alcohol Usage					
Yes	61.00%	18.30%	20.70%	0.2	0.9
No	60.00%	17.20%	22.80%		
Frequency Of Coffee Consumption					
No	66.40%	16.70%	16.90%		
Daily	51.20%	16.10%	32.70%	25.84	<0.01
Occasional	57.40%	25.00%	17.60%		
Frequency Of Fruit Consumption					
Daily	65.50%	18.60%	15.90%		
Weekly	65.30%	15.30%	19.50%	17.4	<0.01
Occasional	52.50%	17.60%	29.90%		
Frequency Of Meat Consumption					

Cont... **Table 3: Dietary Habits, Lifestyle, Family history v/s Status of DM**

No	37.80%	27.00%	35.10%		
Daily	66.70%	16.70%	16.70%	9.86	0.13
Weekly	61.80%	16.30%	21.90%		
Occasionally	54.10%	24.30%	21.60%		
Frequency Of Sweet Consumption					
No	46.90%	12.50%	40.60%		
Daily	73.70%	8.80%	17.50%	17.12	<0.01
Weekly	71.60%	9.00%	19.40%		
Occasionally	58.10%	19.50%	22.40%		
BMI					
Under weight	84.10%	7.90%	7.90%		
Normal	68.30%	13.80%	18.00%	80.94	<0.01
Over weight	51.80%	17.50%	30.70%		
Obese	25.80%	37.60%	36.60%		
Physical Activity					
Sedentary	27.00%	19.80%	53.20%		
Mild	56.40%	22.20%	21.40%	99.99	<0.01
Moderate	74.60%	12.50%	12.90%		
Severe	75.00%	11.40%	13.60%		
Blood Pressure					
Normotensive	78.40%	11.90%	9.70%		
Pre hypertensive	61.10%	20.60%	18.30%	134.3	<0.01
Hypertension	30.30%	22.90%	46.80%		
Family History Of DM					
No	71.90%	14.00%	14.00%		
Either Parent	50.00%	20.80%	29.20%		
Both Parents	12.50%	16.70%	70.80%	127.6	<0.01
Siblings	17.50%	34.90%	47.60%		
Parents+Siblings	25.00%	18.80%	56.20%		
Total	60.10%	17.30%	22.60%		

Conclusion

The prevalence of Diabetes is increasing at an alarming rate even in rural population and nearly half of them aren't aware of their diabetes status. Diabetes when detected early can prevent lot of complications and improve the quality of life of the individual. The people should be educated in knowing the early signs and symptoms of diabetes, importance of physical activity, good dietary practices and get screened for

the condition at least once in every six months to diagnose the condition at very early stage.

Conflicts of Interest: Nil

Source of Funding: Self

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Assessment of Learning and Development of Children Aged 4-5 Years Attending Anganwadi at Urban Field Practice Area -A Cross Sectional Study

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Abstract

Background: Early childhood education (ECE) provides three hours a day education to the children of 3–6 years age group. If implemented properly, it helps children to improve their social competence with better adjustment in school. Aim was to assess learning & development of children aged 4 - 5 years at urban Anganwadi Centres based on child assessment card and objective was to compare learning & development across different domains of child assessment card between undernourished and adequately-nourished children aged 4 - 5 years.

Methodology: Cross sectional study was conducted among 70 children aged 4-5 years at urban Anganwadi Centres. Scores as per domains of Child assessment card were calculated. Height- for -age was calculated. Comparison of performance between stunted and adequately nourished children was done. Data was summarized using numbers & percentages. Chi square was used as test of significance. Among 70 children, 36 (51.43%) were male.

Results: For physical and motor development 16 (22.85%) had perfect score. For Sensory, perceptual and cognitive development 37 (52.86%), for language, literacy and communication 32 (45.71%), for personal-social and emotional development 10 (14.29%) and for creativity 5 (7.14%) had perfect score. Among all 70 children 30(42.8%) were found severely stunted, 21(30%) moderately stunted. Stunted children had poor performance in all five domains. Children have poorest performance in creativity domain.

Conclusion: Overall, learning & development of children aged 4-5 years at Anganwadi centres are poor. Stunting significantly affects domains of physical and motor development and Sensory, perceptual & cognitive development.

Key-words: *Anganwadi Centre, learning and development, early childhood education, stunting.*

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Background

Government of India started Integrated Child Development Services (ICDS) program for children aged 0–6 years through a network of centres, known as "Anganwadi Centre" (AWC) in the year 1975.[1] Anganwadi literally means "courtyard shelter". It

provides various services like nutrition education and supplementation and pre-school activities.[2] Among all services provided by AWC, early childhood education (ECE) which is also known as pre-school education is important part of program which provides three hours a day education to the children of 3–6 years age group. It not only provides formal learning but develops the child's desirable attitudes and behaviour patterns.[3] If ECE developed well in children it will help them to improve their social competence, better adjustment in school and learn the skills of literacy more effectively.[4]

Learning and development among children can be assessed by various tools such as Programme Evaluation Package developed by World Bank, ECE Quality Assessment Scale by Centre for ECE and Development and Child assessment card published by Ministry of Women and Child Development. Child assessment card includes five distinct but interconnected domains i.e. physical wellbeing and motor development; social and emotional development; approach to learning; language development; cognitive development; and general knowledge.[5]

Nutritional status of the child affects the growth and development. Stunting is a useful measure of chronic undernutrition defined as height for age less than two SD (Stunting definition, WHO)[6]

Very few studies have addressed overall development of the children along with comparison of learning and development among undernourished and adequately nourished children.

Hypothesis: Learning and development in all domains of child assessment card is affected in undernourished children as compared to adequately nourished children of 4 – 5 years age group at Urban Anganwadi Centre.

Aim: - To assess learning & development of children aged 4 - 5 years at urban Anganwadi Centres based on child assessment card.

Objective: To compare learning & development across different domains of child assessment card between undernourished and adequately-nourished children aged 4 - 5 years at urban Anganwadi Centers

Methods

A cross sectional study was conducted amongst 70 children aged 4-5 years enrolled under anganwadi centres at urban field practice area of a tertiary care centre during October 2019 to April 2020. Actual data collection was done during February and march 2020. Approval from institutional ethics committee was sought prior to the commencement of data collection.

Field practice area of urban health care centre has five Anganwadi Centers. In all, 352 children were enrolled in these five Anganwadi Centers. Among 352 children, 73 were of age group 4-5 years.. Universal sampling was done. Three children or their reliable informant were not available even after repeated visits and were therefore excluded from the study. Thus, 70 children formed the final sample size. Date of birth record was available at Anganwadi Centres.

A predesigned proforma based on Child assessment card published by Ministry of Women and Child Development was used. Assessment of learning and development was done through direct observation of child's physical activity like throwing, catching and kicking a ball, and history from mother as well as anganwadi worker regarding participation during play time. Child assessment card has five domains viz physical and motor development, sensory, language, personal, social and emotional and creativity. Each question was given score one for yes and zero for no. Score for each domain was calculated. Height and weight were measured using standard protocol. Anthropometric index i.e. height- for- age was

calculated. Z scores between -2 & -3 were considered moderately stunted whereas z scores less than -3 SD were considered as severely stunted[5]. Comparison of performance across different domains between the stunted and adequately nourished children was done.

Data was entered in excel sheet and statistical analysis was done through Open epi online statistical software. Descriptive data was summarized using numbers and percentages. Confidence Interval was calculated for proportion of children performing each activity. Chi square test was used as test of significance for categorical variables. P value less than 0.05 was considered to be statistically significant.

Results

Among 70 children 36 (51.43) were male.

Table 1: Frequency of children performing activities of Physical & motor, Sensory, perceptual & cognitive development(n=70)

Sr No.	Activity	frequency	Percentage (95% CI)
1.	Participates actively during playtime	70	100
2.	Can throw, kick & catch a big ball	70	100
3.	Can run at a fast & slow pace	70	100
4.	Can thread beads in a given sequence	16	22.86(13.02,32.70)
5.	Can join dots to form a shape/figure	21	30(19.26,40.74)
6	Can classify different objects based on odours, tastes & textures etc.	65	92.86(86.83,98.89)
7	Can classify objects on basis of two concepts (shapes & colour) e.g. classify yellow circles	43	61.43(50.03,72.83)
8	Can complete a simple pattern	42	60(48.52,71.48)
9	Can solve a maze/puzzle of 5 pieces	37	52.86(41.17,64.55)
10	Can count objects upto 5 in numbers & match these with numerals.	37	52.86(41.17,64.55)

Table 1 shows that all the children (100%) participated actively during playtime, could throw, kick & catch a big ball and ran at a fast & slow pace; while only 16 (22.86%) children could thread beads in a given sequence. It reveals that 65(92.86%) children amongst 70 children could classify different objects based on odours, tastes & textures; whereas only 37 (52.86%) children were able to solve a maze/puzzle of five pieces & count objects upto five in numbers & match these with numerals.

Table 2: Frequency of children performing activities of Language, literacy & communication and creativity

Sr no.	Activity	Frequency	%(CI)
1	Listens with attention to spoken conversations & stories	37	52.86(41.17,64.55)
2	Can express feelings & ideas in simple sentences & asks questions	60	85.71(77.51,93.91)
3	Can narrate an already heard sequence using appropriate vocabulary	37	52.86(41.1764.55)
4	Enjoys exploring books & other printed material & shows interest in decoding printed words	37	52.86(41.1764.55)
5	Can recognise the first sound of a given word	70	100
6	Shows creativity in daily activities (eg experiments with objects/words in new & different ways)	37	52.86(41.17,64.55)
7	Participates in dance, drama & music activities	16	22.86(13.02,32.70)
8	Uses imagination in drawing, art work & problem solving	26	37.14(25.82,48.46)

Table 2 provides information about activities of Language, literacy, communication and creativity. All 70 (100%) children were able to recognize the first sound of a given word; while only 37 (52.86%) children listened with attention to spoken conversations and stories, enjoyed exploring books & other printed materials.it was found that 37 (52.86%) children showed creativity in daily activities like experiments with objects/words in new & different ways whereas only 16 (22.86%) children used to participate in dance, drama & music activities.

Table 3: Frequency of children performing activities of Personal, social & emotional development

Sr no.	Activity	Frequency	%(CI)
1	Enjoys playing with a group of children	49	70(59.26,80)
2	Interacts comfortably with familiar individuals	70	100
3	Shares with friends/peers	49	70(59.26,80.74)
4	Waits for turn while playing or in other situations	22	31.43(20.55,42.31)
5	Can recognize & express simple emotions such as joy, sadness & anger	70	100
6	Shows curiosity & interest in learning new things	65	92.86(86.83,98.89)
7	Enjoys engaging in pretend play	47	67.14(56.14,78.14)

It is apparent from **table 3** that all 70 (100%) children interacted comfortably with familiar individuals, recognized and expressed simple emotions such as joy, sadness & anger; while only 22(31.43%) children waited for their turn while playing or in other situations.

Table 4: Summary-Distribution of children who have performed all activities in each domain (n=70)

Sr no.	Domain	Perfect score	
		Frequency	**% (CI)**
1	Physical & motor development	16	22.86 (13.02,32.70)
2	Sensory, perceptual & cognitive development	37	52.86(41.17,64.55)
3	Language, literacy & communication	32	45.71(34.04,57.38)
4	Personal social & emotional development	10	14.29(6.09,22.49)
5	Creativity	5	7.14(1.11,13.17)

Table 4 shows that among all domains, children had best performance with respect to sensory, perceptual and cognitive development while worst performance in creativity.

Among all 70 children 30(42.8%) were found severely stunted, 21(30%) moderately stunted whereas only 19(27.2%) children were found adequately nourished as per height for age.

Table 5: Comparison of learning and development among undernourished and adequately nourished children in various domains

Srno.	Domain	Frequency (%) mod/Severe stunting n-40	Frequency (%) Normal height for age n-30	P value Chi square test
1	Physical & motor development	35(87.5)	19(63.3)	0.017 (S)
2	Sensory, perceptual & cognitive development	23(57.5)	10(33.3)	0.046 (S)
3	Language, literacy & communication	24(60)	14(46.7)	0.26 (NS)
4	Personal social & emotional development	35(87.5)	25(83.3)	0.6 (NS)
5	Creativity	37(92.5)	28(93.3)	0.9 (Fisher exact)

S- Significant; NS- Not significant

Table 5 shows comparison of learning and development among undernourished and adequately nourished children in various domains. It was found that, among 70 children, 40 children were moderately/ severely stunted whereas 30 children had normal height for age. Proportion of stunted children who had poor performance was higher in all five domains as compared to adequately nourished children and the difference was statistically significant in the domains of physical and motor development and Sensory, perceptual & cognitive development.

Discussion

Present cross-sectional study was conducted among 70 children aged 4-5 years enrolled under five Anganwadi centres at urban field practice area of tertiary care centre. Many studies have addressed growth of children by assessing nutritional status. Very few studies are focused on overall development of children. Pre-school education is an integral part of development. Present study assessed learning & development of children aged 4 - 5 years at urban Anganwadi centres and compared the learning and development of undernourished and adequately nourished children among these domains. Four to five years age group was selected because after this age, formal schooling of children starts.

Present study evaluated the Anganwadi children in five domains. Performance of majority of children was below expectation level in all the domains. CDC also mentions about similar domains like social and emotional, language/communication, cognitive and movement/physical development.[7]

Ministry of women and child development has provided guidelines at Anganwadi centres for pre-school education kit, materials to be procured and four activity corners[8]. These facilities were grossly lacking at the Anganwadis under study. ICDS programme lays more emphasis on nutrition, growth monitoring & immunization of children. However, the pre-school education component is neglected to certain extent.

Gross motor activities like throwing and kicking ball were performed by all the 70 (100%) children as opposed to the finding of Shrivastav D et al[9] where gross motor activities were performed by only 44.44% children. Fine motor activities which require some trainings were performed by around one fifth of the children in the present study, which is similar to the finding of Shrivastav D et al[9] and Qadiri F et al[10]. In the present study, 61.43% of children could classify objects based on shape and colour. In a study by Kular SS[11], only 2.5% children knew names of four different colours. In the present study, language, literacy perfect score was achieved by less than half of the children. This finding is somewhat similar to the finding of Shrivastav D et al[9] where 61.11% children showed language development. Very few children (7.14%) had perfect score in creativity domain. In contrast to the finding of present Study, Shrivastav D et al[9] shows higher proportion (27.70%) children were creative.

Proportion of stunted children who had poor performance was higher in all five domains as compared to adequately nourished children and the difference was statistically significant in the domains of physical and motor development and Sensory, perceptual & cognitive development. Study conducted by Kesari KK et al [12]found that undernourished children have deficit on most of the cognitive development such as attention, executive function, calculation, visuo-perceptual ability, long term learning and memory and intelligence. In 2018 Kang Y et al [13]conducted a study where they found that stunted children had poor child development indicators which is similar to our study. Similar to our study Wachs et al[14] mentioned in their study malnutrition increases the risk of developmental & cognitive delays in children. In 2020 Alam MA

et al[15] found in their study that stunted children had significantly lower cognitive scores compared to healthy children.

All the children enrolled in anganwadi centres of field practice area satisfying the eligibility criteria were included in the study. Sample size therefore may not be optimal. Study findings thus have limited generalizability.

Overall picture of learning & development of children at Anganwadi emerges not to be satisfactory. Among all five domains of child assessment card, domain of creativity shows poorest performance. Undernourishment affects learning and development in all the domains and is significantly affected in domains of physical and motor development and Sensory, perceptual & cognitive development.

Systematic implementation of early childhood education according to the guidelines prescribed by Ministry of women and child development should be done at each Anganwadi. Special emphasis on creativity domain should be given. Special focus on undernourished children for their learning and development along with nutritional status is required. Full integration of health and pre-primary education can achieve overall development of the children.

Abbreviations: Not Applicable

Declarations:

Ethics approval and consent to participate: Approval from institutional ethics committee of SVN Government Medical College, Yavatmal, India (vide letter no 33/2020 dated 23/01/2020) was sought. Written informed consent of mothers of participating children was taken.

Consent for publication: Consent was taken prior to data collection from mothers of participating children.

Availability of data and material: Data supporting findings of the study are available with corresponding author

Competing Interests: The authors declare that they have no competing interests

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A Bibliometric Analysis of the 100 Most Cited Articles on Nitrous Oxide Conscious Sedation

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Abstract

Background: A bibliometric analysis helps to analyze the affluence of research articles in a specific field. Citation analysis determines the popularity and impact of research articles, authors, and publications within a field. The aim of this study is to employ bibliometrics to purvey statistical analysis of publications on nitrous oxide conscious sedation published from 1972 to 2021.

Method: The titles and abstracts of the articles were taken from Elsevier's Scopus database. The articles were independently scrutinized by two authors and selected based on their citation and study characteristics. VOSviewer software was used to create a collaboration network amongst keywords, authors, affiliations, and countries.

Conclusion: A total of 729 articles were published on nitrous oxide conscious sedation, out of which 100 most cited articles were extracted and analyzed. Amid the papers with high levels of evidence, 2 were meta-analyses and 6 were randomized clinical trials. The topic most addressed was the systematic approach for safe sedation of children for procedures and comparison of different drugs used in sedation procedures.

The findings of this paper will help clinicians and students to refer appropriate articles for evidence-based clinical decision-making as well as to follow a methodical approach for sedation procedure.

Keywords: *Anxiolysis, Conscious sedation, Inhalational sedation, Nitrous oxide.*

Introduction

Patient management is basic premise for a successful dental treatment especially when children are considered.[2] Therefore,to instill positive attitude towards dental care in younger generation and for a successful outcome, behavioralmanagement is considered as a cornerstone in pediatric dentistry. There are substantial alternatives to manage them, however, proper selection of behavioral management technique is utmost important.[3]

Conscious sedation, a pharmacological technique of behavior management, has recently gained a lot of interest in medicine and dentistry due to its long history of safety for almost all patients routinely treated in the ambulatory dental setting.[2,8] In fact, it could be considered as the safest of all the modalities available for sedation in dentistry, nonetheless poses few limitations or may at least pose a relative contraindication.[8] Therefore, carefully inspecting the

medical history of a patient is an utmost important. For e.g.in inhalational sedation, the inability to use a nasal mask is an absolute contraindication to the use of nitrous oxide.[2]

A significant number of studies have been published regarding nitrous oxide conscious sedation. The scientific publications have grown progressively in terms of both the number of journals and their content in last decades. This makes it cumbersome for clinicians to find the most valuable article for evidence based clinical decision. Hence, the objective of this present study was to identify the top-cited articles published on nitrous oxide conscious sedation in the context of pharmacological behavior management technique to accentuate the influential papers and authors over time. Also, the characteristic features of the most cited articles have been discussed.

Procedure

1. Data Source

An electronic bibliometric search was conducted on Elsevier's Scopus database using the search strategy "Nitrous Oxide" AND "Conscious Sedation" on 14th March 2021 with no search restriction on the publication year. A total of 100 top-cited articles were extracted. The search included papers published in peer-reviewed journals in the English language. The top 100 highly cited articles were scrutinized and designated according to the descending order of the citation count. Citation count, if similar, was ranked according to a recent year of publication. For every article, data compilation for each article included the title of the paper, journal name, publication year, institution name country of origin, and the authors.

2. Data Extraction

An independent search was conducted by two authors (PP & NQ) in which journal name, publication year, affiliations, country of origin, and the authors were extracted from the selected article. Any, disagreement if present, was resolved by the third author (MP). Analysis and network visualization of the extracted data was done with the help of VOSviewer software (version 1.6.13; Leiden University Center for Science and Technology Studies, Netherlands).

Results

1. Citation count and publication year

The top-cited articles received 7911 total citations, with an h-index of 52. Total citations after removal of self-citations were 7409, with an h-index of 49. All the articles werepublished in English. The number of citations in the last five years varied between 95 and 495 (average number of citations = 385.6). The top 3 articles received more than 200 citations each. The guidelines are given by Coté et al, i.e., Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures: An update published in American Academy of Pediatrics has been cited the maximum number of times (473). A review by Krauss et al in the New England Journal of Medicine has received 325 citations followed by an Audit given by Pandit et al was cited 214 times. The least number of citations (34) was received by four articles, and these were ranked in the list according to their citation density. The year 1996 had the highest number of publications of the top 100 articles (n = 8) followed by 2004 (n=7) and 2003 and 2004 (n=6). There was an increase in the prBoportion of articles on nitrous oxide conscious sedation from 1991. (Figure-1)
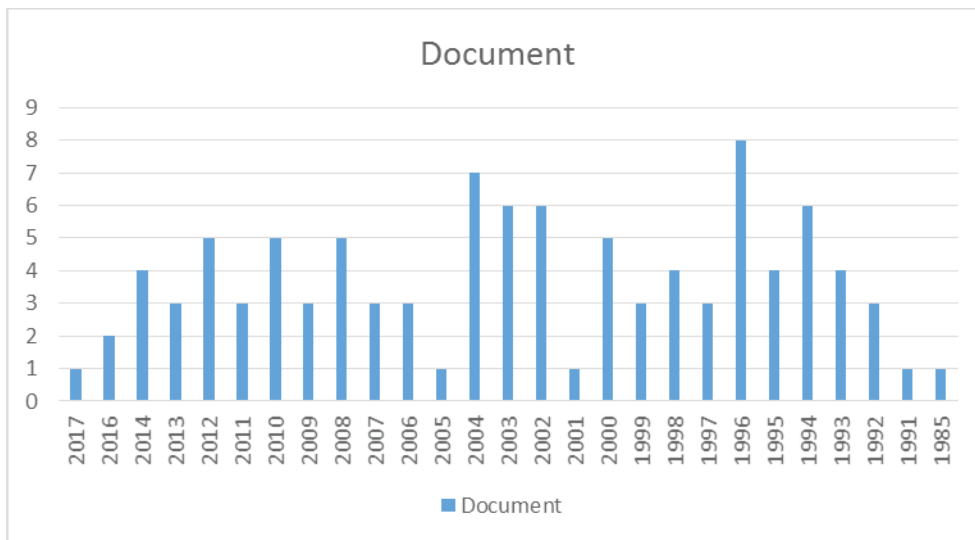
Figure-1 represents the documents based on the year of publication.

2. Authors

A total of 158 researchers contributed to the top-cited articles. Litman RS and Berkowitz RJ authored seven articles each (Figure 2). 82 articles had 1-5 authors contributing to the research, whereas the remaining 18 articles had 6 to 12 authors in collaboration. A collaboration network on Vosviewer softwarewas also developed and the analysis showed collaboration between authors who contributed to 2 or more articles of 100 highly cited article list. There was a strong association seen between authors in 7 clusters. The number of articles published by each author is denoted by nodes, and the number of publications between two researchers who have co-authored is represented by the joining lines.*(Figure 3)*
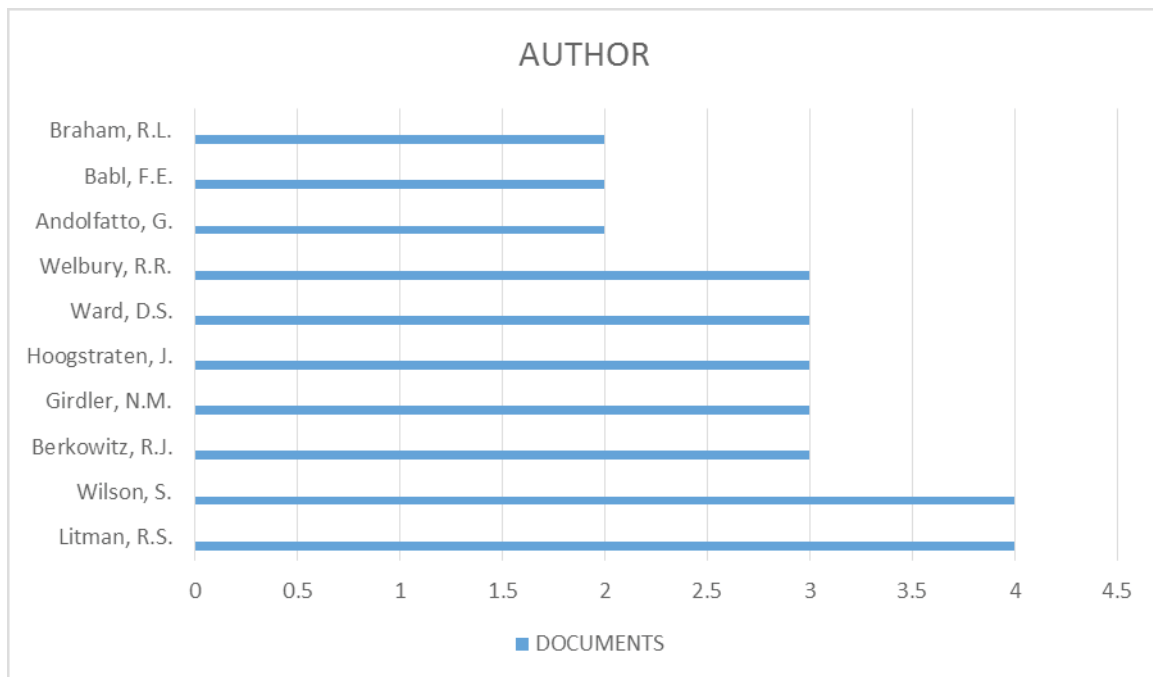
Figure 2 shows the number of documents per author.
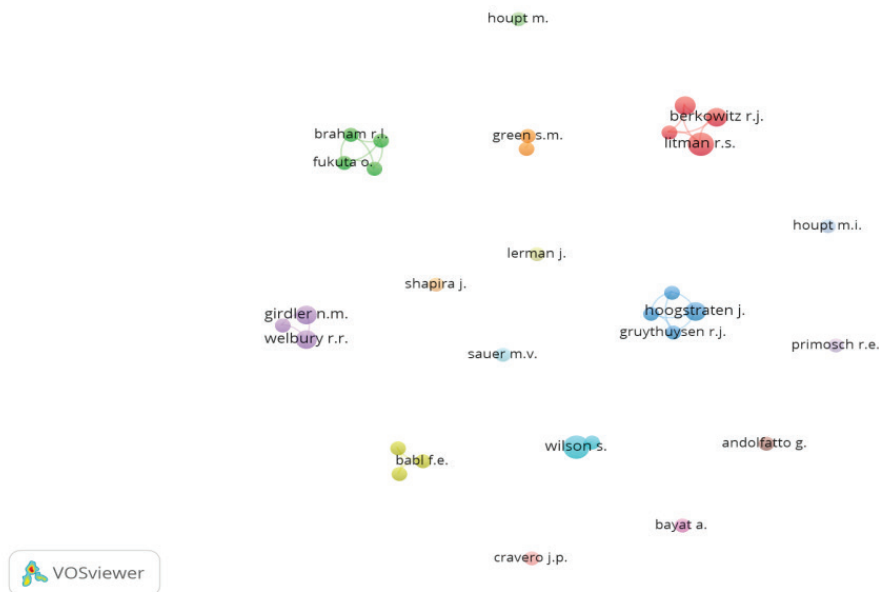
Figure 3represents the network collaboration between authors.

Table 1 represents the journals in which the 100 most cited articles were published.

	Journal	Impact Factor	Subject Area and Category	Total number of Articles
1.	Pediatric Dentistry	1.9	General Dentistry; Dentistry	12
2.	Anaesthesia	8.3	Medicine: Anesthesiology and Pain Medicine	5
3.	Anesthesia And Analgesia	5.8	Medicine: Anesthesiology and Pain Medicine	4
4.	Archives Of Pediatrics And Adolescent Medicine	-	Medicine: Pediatrics, Perinatology and Child Health	4
5.	PaediatricAnaesthesia	3.5	Medicine: Pediatrics, Perinatology and Child Health; Medicine: Anesthesiology and Pain Medicine	4
6.	Pediatrics	9.6	Medicine: Pediatrics, Perinatology and Child Health	4
7.	Anesthesiology	8.1	Medicine: Anesthesiology and Pain Medicine	3
8.	Asdc Journal Of Dentistry For Children	-	Dentistry: General Dentistry	3
9.	British Journal OfAnaesthesia	9.4	Medicine: Anesthesiology and Pain Medicine	3
10.	Endoscopy	7.4	Medicine: Gastroenterology	3
11.	International Journal OfPaediatric Dentistry	3.6	Dentistry: General Dentistry	3
12.	Journal Of Oral And Maxillofacial Surgery	2.8	Dentistry: Oral Surgery; Medicine: Surgery; Medicine: Otorhinolaryngology	3
13.	Anesthesia Progress	0.8	Medicine: Anesthesiology and Pain Medicine	2

***Cont...*Table 1 represents the journals in which the 100 most cited articles were published.**

14. Annals Of Emergency Medicine	7.4	Medicine: Emergency Medicine	2
15. Archives Of Disease In Childhood	4.7	Medicine: Pediatrics, Perinatology and Child Health	2
16. Current Opinion InAnaesthesiology	4.2	Medicine: Anesthesiology and Pain Medicine	2
17. Gastrointestinal Endoscopy	7.3	Medicine: Radiology, Nuclear Medicine and Imaging; Medicine: Gastroenterology	2
18. Journal Of Clinical Pediatric Dentistry	1.7	Dentistry: General Dentistry; Medicine: Pediatrics, Perinatology and Child Health	2
19. Academic Emergency Medicine	5	Medicine: Emergency Medicine	1
20. American Journal Of Dentistry	1.5	Dentistry: General Dentistry	1
21. Anesthesiology Clinics	3.5	Medicine: Anesthesiology and Pain Medicine	1
22. British Journal Of Radiology	3.7	Medicine: Radiology, Nuclear Medicine and Imaging	1
23. Canadian Journal OfAnaesthesia	5.3	Medicine: Anesthesiology and Pain Medicine	1
24. Chest	12.1	Medicine: Critical Care and Intensive Care Medicine; Medicine: Cardiology and Cardiovascular Medicine; Medicine: Pulmonary and Respiratory Medicine	1
25. Cochrane Database Of Systematic Reviews	7.4	Medicine: Pharmacology (medical)	1
26. Community Dentistry And Oral Epidemiology	4.1	Dentistry: General Dentistry; Medicine: Public Health, Environmental and Occupational Health	1
27. Contraception	5.1	Medicine: Obstetrics and Gynecology; Medicine: Reproductive Medicine	1
28. Current Opinion In Pediatrics	4.3	Medicine: Pediatrics, Perinatology and Child Health	1
29. Danish Medical Journal	2.2	Medicine: General Medicine	1
30. Digestive Diseases And Sciences	5.1	Medicine: Gastroenterology; Biochemistry, Genetics and Molecular Biology: Physiology	1
31. Drugs	9.6	Medicine: Pharmacology (medical)	1
32. EMA Emergency Medicine Australasia	2.0	Medicine: Emergency Medicine	1
33. Emergency Medicine Clinics Of North America	3.3	Medicine: Emergency Medicine	1

***Cont... .*Table 1 represents the journals in which the 100 most cited articles were published.**

34. Emergency Medicine Journal	3.2	Medicine: Emergency Medicine; Medicine: Critical Care and Intensive Care Medicine	1
35. European Journal Of Gastroenterology And Hepatology	3.8	Medicine: Gastroenterology; Medicine: Hepatology	1
36. European Respiratory Journal	12.9	Medicine: Pulmonary and Respiratory Medicine	1
37. Expert Review Of Neurotherapeutics	6.2	Medicine: Pharmacology (medical); Medicine: Neurology (clinical); Neuroscience: General Neuroscience	1
38. Fertility And Sterility	9.8	Medicine: Obstetrics and Gynecology; Medicine: Reproductive Medicine	1
39. JAMA Ophthalmology	9	Medicine: Ophthalmology	1
40. JAMA The Journal Of The American Medical Association	26.3	Medicine: General Medicine	1
41. Journal Of Assisted Reproduction And Genetics	4.6	Medicine: Obstetrics and Gynecology;Medicine: Reproductive Medicine;Biochemistry, Genetics and Molecular Biology: Developmental Biology;Biochemistry, Genetics and Molecular Biology: Genetics;Medicine: Genetics (clinical)	1
42. Journal Of Neurointerventional Surgery	7.2	Medicine: Surgery;Medicine: Neurology (clinical)	1
43. Journal Of Neurosurgical Anesthesiology	4.4	Medicine: Surgery;Medicine: Anesthesiology and Pain Medicine;Medicine: Neurology (clinical)	1
44. Journal Of Pain And Symptom Management	5.1	Nursing: General Nursing;Medicine: Anesthesiology and Pain Medicine; Medicine: Neurology (clinical)	1
45. Journal Of Pediatric Surgery	3.5	Medicine: Surgery; Medicine: Pediatrics, Perinatology and Child Health	1
46. Journal Of The American Association Of Gynecologic Laparoscopists	-	Medicine: Obstetrics and Gynecology	1
47. Journal Of The American Dental Association	4.3	Dentistry: General Dentistry	1
48. Neurology	10.4	Medicine: Neurology (clinical)	1
49. New England Journal Of Medicine	66.1	Medicine: General Medicine	1
50. Pediatric Drugs	3.9	Medicine: Pediatrics, Perinatology and Child Health; Medicine: Pharmacology (medical)	1

Cont... .Table 1 represents the journals in which the 100 most cited articles were published.

51.	Pediatric Emergency Care	1.6	Medicine: Emergency Medicine; Medicine: Pediatrics, Perinatology and Child Health	1
52.	Pediatric Radiology	3.6	Medicine: Pediatrics, Perinatology and Child Health; Medicine: Radiology, Nuclear Medicine and Imaging	1
53.	Psychopharmacology	6.3	Pharmacology, Toxicology and Pharmaceutics: Pharmacology	1
54.	Thorax	13.3	Medicine: Pulmonary and Respiratory Medicine	1
55.	World Journal Of Gastroenterology	7.1	Medicine: Gastroenterology	1

c. Impact factor

Table 1 represents the impact factor(IF) of the list of journals. The articles identified in the search were published in 55. The maximum number of articles (n = 12) were contributed by the pediatric dentistryjournal, followed by the anesthesia journal (n = 5), anesthesia and analgesia, archives of pediatrics, adolescent medicine, and pediatricanesthesia (n=4)). Rests of the six journals have contributed three, six journals contributed two and thirty- seven journals contributed only a single article, each in the top 100 list. The IF of the journals ranged from 0 to 66.1 (average 6.78). Impact factor 66.1 was the highest which was the New England journal of medicine, which contributed one article.

d. Institute, Countries of origin

The top-cited 100 most influential articles on nitrous oxide conscious sedation originated from 21 different countries. United States carried out a total of 50 studies, followed by 15 in Australia, Netherland.Figure 3 shows the collaboration network of countries formed applying a threshold of 2 or more collaborations. Most relatable articles were published by collaboration between Greece, Spain, Denmark and Germany. Greece, Spain and Denmark have more collaboration with Netherland and Switzerland. *(Figure 4)*
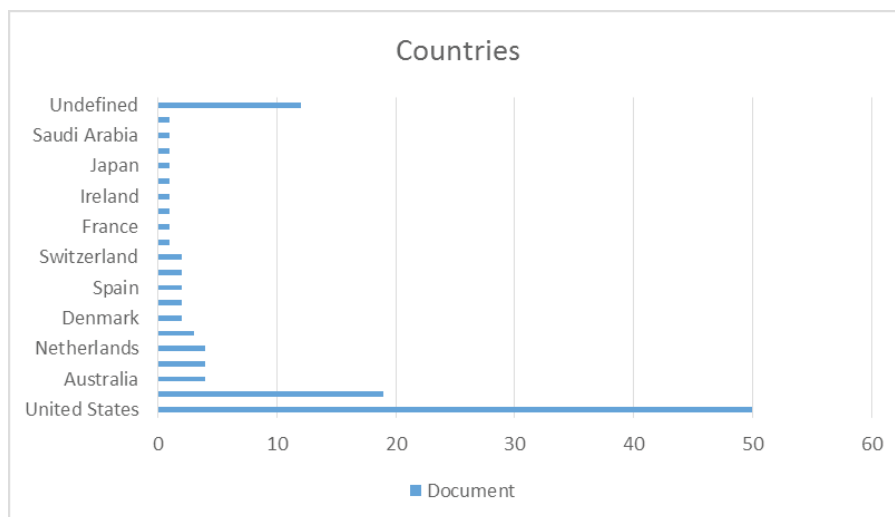
Figure 3 represents the number of documents per country.
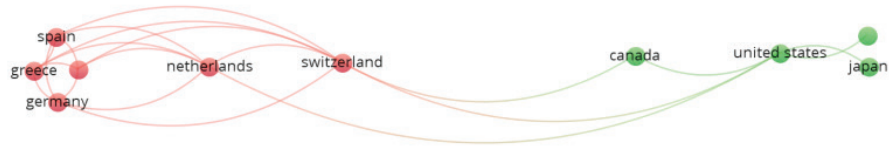
Figure 4 represents the network collaboration between countries.
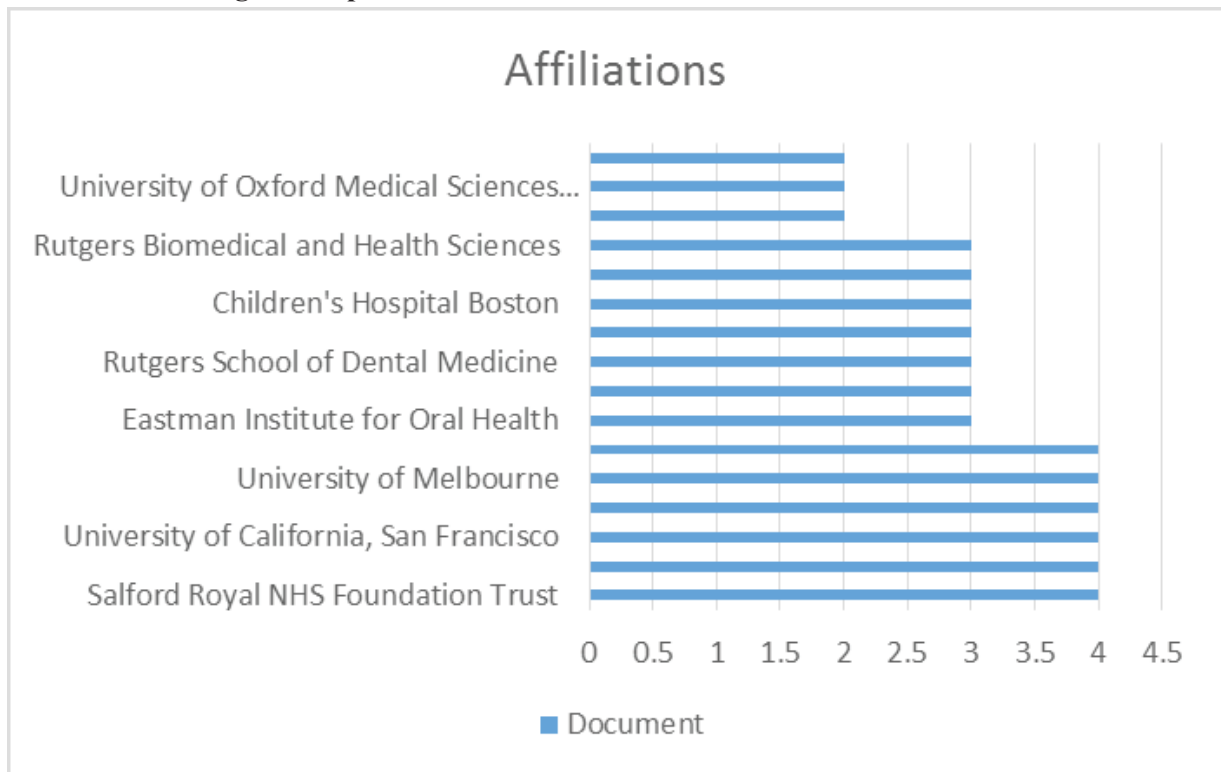
Figure 5 represents the number of documents per Institute/Affiliation

The Salford Royal NHS Foundation Trust, University of California(San Francisco), University of Melbourne published the most papers (n = 4), which is followed by Eastman Institute for Oral Health, Rutgers School of Dental Medicine, Children's Hospital Boston and Rutgers Biomedical and Health Sciences (n=3). *(Figure 5)*

e. Type of study and Topic addressed.

There were 45 original articles, 14 review papers, 6 guidelines, 2 curriculums and 2 conference papers. Cohort (n = 27) was a common study design, followed by expert opinion/narrative reviews (n = 22), questionnaire (n=4) and survey (n = 4). These study designs represented nearly 57% of all the articles.

Amongst the studies with high levels of evidence, 2 were meta-analysis and 6 were randomized clinical trials. The topics commonly addressed were safety guidelines for administration of different drugs, preventive measures/treatment, and the comparison between different drugs. The subject area mostly covered is medicine followed by dentistry.

f. Keywords

Of the top-cited studies, a total of 157 keywords were identified with minimum occurrence of 5. *Figure 6*exhibits the keyword co-occurrence network analysis. The biggest node is "human" which appeared 99 times followed by "nitrous oxide" (90) and "conscious sedation" (86).

Figure 6 represents the keyword co-occurrence network of the 100 top-cited articles

Discussion

This article annals a bibliometric approach in terms of evidence-based decision making while using pharmacological behavior management of uncooperative children. With a huge number of articles published on nitrous oxide conscious sedation, it is difficult for researchers, students, and clinicians to narrow their search for attainable number of high-quality articles. Thequality of the publication by the scientific journal is solely appraised by the impact factor but does not usually commensurate correctly to the standard or popularity of the publication. Citation analysis is one of the statistical tools to assess the most remarkable articles in a specific field. The distinction of article is recognized based on the number of citations. Garfield stated that publications receiving 100 or greater citations are classified as classic papers.[2] This study identified 19 articles that have been cited more than 100 times, making them citation classics. There was an increasing trend of publication since 1991. The discrepancies in publication growth rates may partly be associated with advances in techniques and materials triggering scientific growth and research. The oldest and most recent publications were from the years 1985 and 2017, respectively. The top-cited articles on nitrous oxide conscious sedation have more than 300 citations, in agreement with different specialties.In respect of scientific articles by individual authors, Litman RS and Berkowitz RJ topped the list with 4 articles as the first author. The average number of authors per article were 1.58. There is a strong association seen between authors in 7 clusters, but they are located far apart showing less relatedness between them.

The h-index (Hirsch cited index), a metric that evaluates the cumulative impact of an author's proficiency and collates publications to citations, was estimated.[25] An h-index of 50 of the most commended articles was found, which means that 50 papers, published on Nitrous oxide conscious sedation, have minimum of 50 citations. However, author's cumulative research contribution is not a comprehended by the h-index.[5] Twenty-five years ago, almost all the articles on nitrous oxide conscious sedation were from researchers in the United States. The findings show that higher economic countries are inclined towards biomedical research, conceivably due to better medical resources and funding. The findings of our study showed a vast number of scientific papers originated from universities in the United States. The United States, Australia, Netherlands, Spain, Switzerland and Denmark account for nearly 69% of the top-cited publications. The level of evidence of any paper is strongly linked to study design. Evidence-based practice, high-quality research, preferably systematic reviews, randomized clinical trials, and cohort studies are given primacy.
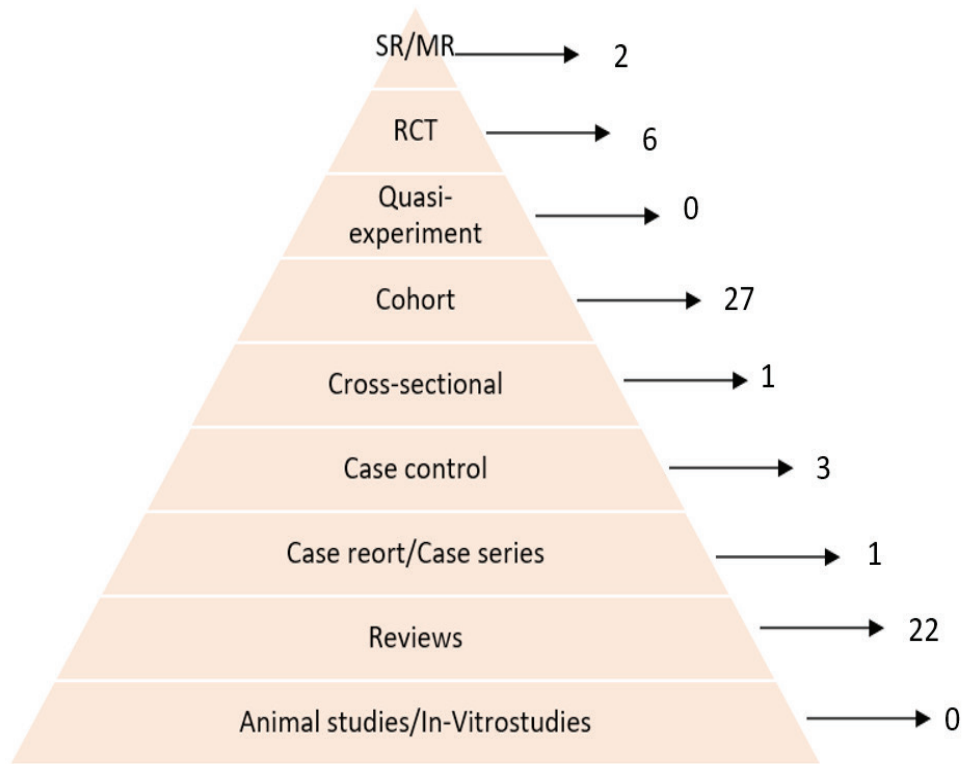
Figure 7 Distribution of articles on early childhood caries according to study design

Regarding the topics addressed, a considerable number of articles consisted of cohort studies, mostly comparing different drugs used while sedation procedure. Reviews were mostly based on the systematic approach for the safe sedation of children for procedures. Out of the 3 topmost cited articles, the first paper mentioned the guideline given by collaborative effort of the American Academy of Pediatrics and the American Academy of Pediatric Dentistry to offer pediatric dentists an updated information and guidance to systematically deliver safe sedation in children.[6] An audit 5th National Audit Project (NAP5) which presented the main findings on accidental awareness during general anesthesia (AAGA)[20] was the second article followed by a review on systematic approach for pain management and anxiolysis, including education of the staff and protocol development, in emergency setting for children.[10] It is imperative to conduct more systematic reviews and meta-analysis on different field to acquire more knowledge about administration of different drugs and their pharmacokinetics and pharmacodynamics.

All the keywords by author and indexed in the publication were analyzed by VOSviewer software. The articles of the relevant topics are retrieved by using from various search engines keywords aid researchers to retrieve articles relevant to a topic keyword from various search engines, authors wisely select the keywords. The keyword 'Nitrous oxide' and 'Conscious sedation' appeared 99 and 86 times, respectively.

Although bibliometric analysis evaluates the importance and impact of the article in a specific field, it has few inherent limitations. The Scopus database was used in this study to retrieve the citation analysis information. Albeit Scopus is the most authentic and comprehensive database and provides about 20% more coverage than Web of Science[19]. It may not

be representative of the entire peer-reviewed paper; therefore the probability of exclusion of influential articles from other databases (PubMed and Web of Science) cannot be ruled out.

Citation analysis is usually belittled with the influence of time. Articles published earlier usually get enough time to get global circulation and hence stand a higher chance for receiving added citations than the recently published papers irrespective of the scientific value. Hence, the recent papers, although highly significant, would not reflect in such an analysis. Moreover, studies that have become landmark trials achieve fewer citations over time, because their findings are so universally accepted that their source or contributors are often forgotten. This is known as 'obliteration by incorporation' effect.[23]Thus, citation count does not remark the quality of an article but helps a quantitative evaluation of the scientific impact of a paper in a specific field. Similarly, no significant differences were reported in the h-index as well.

Conclusion

For pediatric patients with intellectual disability and fearful patients with low pain tolerance, conscious sedation can be considered as safe, practical and effective. When an inhalational anesthetic is considered, nitrous oxide as a single agent provides exemplary safety and is excellent for providing anxiolysis for apprehensive patients.

1. This is the first article to describe a bibliometric analysis of nitrous oxide conscious sedation in terms of evidence-based dentistry that gives a satisfactory scientometric view of Nitrous oxide conscious sedation research in the world.

2. The list of top-cited articles herein presented will serve as an important source of information for clinicians in making clinical decision making as well for planning systematic approach in procedural sedation.

3. Expanding international exchanges has encouraged academic collaborations. More such collaborations amongst researchers are required in the future to establish a systematic approach for safe sedation procedure.To achieve a complete appreciation during its clinical use, expansion of such international exchanges through academic collaborations is recommended.

4. The quality of the publication is not necessarily reflected by the number of citations. A further research and analysis are needed with other databases that could give a better apprehension about the dynamics of citations.

Ethical Clearance- Taken from the Ethics Committee of Dr. D. Y. Patil Vidyapeeth,Pune.

Source of Funding- Nil

Conflict of Interest - Nil

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Prevalence of Thyroid Dysfunction in Abnormal Uterine Bleeding

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Abstract

Objective: To study the prevalence of thyroid disorders and its correlation with menstrual disorders.

Methods: 100 women aged between 15 and 45 years who attended gyne OPD in Sraswathi medical college, U.P, were included for this cross-sectional study. The study group comprised 50 patients presented with menstrual complaints. The control group consisted of 50 women of same age group with complaints other than menstrual disorders. Thyroid function tests, anti-TPO antibody estimation, and endometrial sampling were done in all patients.

Results: In patients with menstrual disorders, 44 % had thyroid disorders in which subclinical hypothyroidism was prevalent in 20 %, overt hypothyroidism in 14 %, and overt hyperthyroidism in 8 % of the women. Autoimmune thyroid antibodies were present in 30 % patients of women with menstrual disorders. On endometrial sampling, hypothyroid patients mainly had proliferative endometrium (42.85 %) whereas hyperthyroid had atrophic endometrium (60 %).

Conclusions: Thyroid dysfunction is an important causative etiology of menstrual abnormalities. Assessment of thyroid function should be done in all patients with menstrual disorders to avoid unnecessary interventions like curettage and hysterectomy.

Keywords: *Menstrual disorders, Thyroid dysfunction, Subclinical hypothyroidism, Thyroid autoimmunity*

Introduction

Menstrual disorders pose a huge burden on gynecology OPD, accounting for approximately 20 % of attendance [1]. Thyroid hormones play an important role in normal reproductive physiology through direct effects on the ovaries and indirectly by interacting with sex hormone-binding globulin. Thyroid dysfunction can lead to menstrual irregularities and infertility [2]. In India, thyroid disorders are among the most common endocrine diseases [3].

Onset of thyroid disorders increases with age, and it is estimated that 26 % of premenopausal and menopausal women are diagnosed with thyroid disease [4]. Thyroid disorders are more common in women than in men and in older adults compared with younger age groups [5].

Hypothyroidism is associated with a wide spectrum of reproductive disorders ranging from abnormal sexual development, menstrual irregularities, and infertility [6]. The impact of hypothyroidism on the menstrual cycle has been identified since the 1950s and leads to changes in cycle length and blood flow [6]. Subclinical hypothyroidism has been associated with occult menorrhagia (mild disturbances in menstrual

amount and duration) before becoming symptomatic [7]. The prevalence of subclinical hypothyroidism is as high as 9.5 % in women [8].

Hyperthyroidism occurring before puberty has been reported to delay the onset of menses [9]. In women of fertile age group, oligomenorrhea and amenorrhea are the commonest abnormalities associated with hyperthyroidism [9]. These irregularities sometimes precede thyroid dysfunction. In the present times, subclinical hyper- and hypothyroidism can be diagnosed very early, whereas these would have passed unnoticed a few decades ago.

Timely detection of Thyroid disorder in patients presenting with menstrual disorders and their management can prevent surgical intervention like curettage and hysterectomy.

Thyroid autoimmunity has been shown to have association with various kinds of thyroid dysfunction. Although there are foreign studies to relate the occurrence of thyroid dysfunction in women with menstrual disorders, but there are not many Indian studies in this regard [10, 11].

Objective

To study the prevalence of thyroid dysfunction and thyroid autoimmunity in patients with menstrual disorders and to study their correlation

Methods

The present study was conducted in the Department of Obstetrics and Gynecology, Saraswathi institute of medical sciences,U.P, in the period of 12 months . 100 women of reproductive age group 15–50 years were selected. Study group comprised 50 women with menstrual disorders like menorrhagia, oligomenorrhea, hypomenorrhea, polymenorrhea, metrorrhagia, and amenorrhea and, and control group comprised women with complaints other than menstrual disorders. Patients with menstrual disorder

having any known organic pathology like uterine fibroid, adenomyosis, tubercular endometriosis, polyp, uterine malignancy, etc. and patients with IUCD in utero were excluded from study.

After taking detailed history regarding age, parity, age of menarche, menstrual disorders and dysmenorrhea, general physical examination along with pelvic examination was carried out in women with menstrual complaints. Routine investigation like Hb, Platelet count, TLC, DLC, ESR, ABO-Rh, and thyroid profile that includes T3, T4, TSH, and anti-TPO antibody was performed in all patients. Direct quantitative determination of T3, T4, and TSH by ELISA using human serum-based calibration was performed. The calibrators were calibrated using a reference preparation, which has been assayed against the WHO 2nd IRP 80/558. They were also subjected to special investigations which include Trans-abdominal scan, endometrial sampling, and hysteroscopy (wherever indicated).

Patients were considered as euthyroid if the TSH, T3, and T4 were within normal range (TSH level = 0.39–6.16 µIU/ml, free T3 level = 1.4–4.2 pg/ml, and free T4 level = 0.8–2.0 ng/ml); when TSH was high with T3 and T4 within normal range, they were labeled as subclinical hypothyroidism. Overt hypothyroidism was diagnosed with high TSH and low T3 and T4 levels, subclinical hyperthyroidism if the TSH was low and T3 and T4 levels were in normal range, and overt hyperthyroidism when TSH level was low and T3 and T4 levels were high.

Results

The study and control groups were comparable in respect of age, religion, and socioeconomic status.

Out of all the types of menstrual irregularities, 25 (50 %) presented with menorrhagia, 10 (20 %) had hypo/oligomenorrhea, 8 (16 %) had polymenorrhea, 6 (12 %) had metrorrhagia, and 1 (2 %) had amenorrhea.

Thyroid autoimmunity in the form of thyroid anti-TPO antibody was more prevalent in the study group (30 %) compared to control group (8 %). The difference is statistically significant with a *p* value of 0.005 (<0.05).

Among the patients with hypo/oligomenorrhea, one case (10 %) had subclinical hypothyroidism, one case (10 %) had overt hypothyroidism, one case (10 %) had subclinical hyperthyroidism, and three cases (30 %) had overt hyperthyroidism.

Among the patients with metrorrhagia, one case (16.67 %) had subclinical hypothyroidism.

Among the patients with menorrhagia, six cases (24 %) had subclinical hypothyroidism and four cases (16 %) had overt hypothyroidism.

Among the patients with polymenorrhea, two cases (25 %) had subclinical hypothyroidism and 2 (25 %) had overt hypothyroidism.

This difference was statistically significant (*p* value = 0.027, i.e., <0.05)

Among the patients with high TSH level, 42.85 % had proliferative endometrium, 28.57 % had secretory endometrium, 21.42 % had hyperplastic endometrium, and 7.14 % had atrophic endometrium.

Among the patients with low TSH level, 20 % had proliferative and secretory endometrium each, and 60 % had atrophic endometrium.

So, we can see that atrophic endometrium (60 %) is the commonest histopathological finding in women with hyperthyroidism and proliferative endometrium (42.85 %) with hypothyroidism.

This difference was statistically significant (*p* value = 0.018, i.e., < 0.05)

Discussion

Thyroid disorders in general and hypothyroidism in particular are the common causes of menstrual disorders in women. Menarche, pubertal growth and development, menstrual cycles, fertility and fetal development, postpartum period, reproductive years, and postmenopausal years are profoundly influenced by the thyroid status of women. It is recognized universally that menstrual disturbances may accompany and even may precede thyroid dysfunction.

Menorrhagia was the most common complaint among the patients with menstrual disorders, and most of the patients in other groups presented with white discharge in our study. Similar were observations of Pahwa [13] (50 %) and Padmaleela [14] (50 %), where menorrhagia was the most common complaint.

In our study, the prevalence of *hypothyroidism and hyperthyroidism* in patients with menstrual disorders is almost *two times* higher than in the control population. In the study by Kaur , out of 100 patients studied, 14 had hypothyroidism. In the study by Sharma , prevalence of hypothyroidism was detected in 22 % patients of DUB and hyperthyroidism in 14 %. In the study by Pahwa , 22 % cases of hypothyroidism and 76 % of euthyroidism were reported, whereas Padmaleela observed thyroid disorders in 26.5 % patients of DUB. The prevalence of hyperthyroidism was 8.4 % among the DUB patients as assessed by the findings of their thyroid function tests. Gowri found 17.6 % women with hypothyroidism, 2.7 % with subclinical hypothyroidism, and 4.7 % with hyperthyroidism, which is similar to our study.

In our study, the prevalence of *anti-thyroid peroxidase antibodies* in patients with menstrual disorders is almost *four times* higher than in the control population. This emphasizes the significance of estimation of thyroid antibodies in patients with menstrual disorder. Different authors have used different methods for Anti-TPO antibody assay, and their results may vary with kits from different

manufacturers. Our samples were evaluated for Anti-TPO Antibody using ELISA microwell kit (Xema Co., Ltd, Germany), with cutoff value 75 IU/ml.

Conclusions

From our study, it may be concluded that there is a strong correlation of thyroid dysfunction with menstrual disorders. In the patients with menstrual dysfunction, if thyroid disorders are timely diagnosed and treated, the menstrual irregularities settle, and unnecessary intervention like hormonal treatment and surgery can be avoided. The menstrual abnormalities most commonly seen are menorrhagia followed by hypo/oligomenorrhea and polymenorrhea. Since thyroid dysfunction is an important treatable cause of menstrual disorder, estimation of thyroid status should be a part of the battery of investigations being done in the patients of menstrual disorders. The prevalence of subclinical hypothyroidism in patients with menstrual disorders emphasizes the need to detect the hypothyroidism at this stage, so that treatment can be initiated and progression to overt disease be slowed down as a part of management of menstrual disorders.

The estimation of anti-TPO antibody is an expensive test. We recommend its testing as a routine test in the evaluation of patients with menstrual disorders. However, prospective studies are required to analyze the cost effectiveness of anti-TPO antibody testing and its possible benefits with regard to treatment.

Ethical Clearance- Taken from ethical committee of institution

Source of Funding- Self

Conflict of Interest – Nil

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Original Research Article

Changes in Knowledge and Attitude before and after a Health Education Program among Primary School Teachers Regarding Dental Anxiety in Children

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Abstract

Introduction : Children are subjected to primary education from a very young age during which they spend quality time with teachers. Hence assessing the knowledge of teachers, with regards to dental anxiety is an essential aspect for health care providers.

Purpose : The purpose of the study was to evaluate the knowledge and awareness status before and after a health education program among primary school teachers regarding dental anxiety in children by way of a questionnaire.

Methodology : A total of 214 primary school teachers were approached in Chennai for the study purpose. The idea behind the survey was explained in detail, consent obtained and data collection was done. Statistical analysis was performed using' Z ' test as the data was parametric and quantitative in nature.

Results : In the knowledge category, the results showed 70.83% improvement after health education and in the attitude category, it showed 90% improvement.

Conclusion : Health education tools play a major role in contributing towards increasing the knowledge and attitude and thus can be implemented on a larger scale.

Key Words *: Attitude, knowledge, awareness, dental anxiety status, teachers.*

Introduction

Children encounter general dental anxiety since a dental environment is thoroughly a new experience, even though the ambience is inviting and child friendly.[1] Children spend most of their prime time in school with their favourite teachers. Teachers can be sought to remove their anxiety and fear with regards to a dental scenario so that we can achieve our target of creating an anxiety free future society.[2] Thus the aim of our study is to assess the knowledge and attitude before and after a health education program among primary school teachers regarding dental anxiety in

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children and thereby check for the effectiveness of the program.

Methodology

The study was done for a duration of 3 months simple random sampling method was used. The study population consisted of 214 participants which was statistically determined. Consent and assent was obtained. Questionnaire was designed, modified and the final version was developed.

Part 1 contained the Demographic details along with educational background and teaching experience.

Part 2 contained questions pertaining to knowledge and attitude about dental anxiety in children

Questionnaire was pilot tested on a smaller number of participants which helped us to modify the sequence of questions and the text flow. The questionnaire was distributed among 214 teachers who participated in the study. Data collection and analysis was done.

Results

Table 1 In our study depicts the Gender distribution of the participants among whom there were 81.3% female teachers and 18.7% of male teachers.

Table 2 In our study depicts grading of the knowledge level amongst the participants which showed 0-9 % in the poor category, 10-14 % in the average category, 15-19% in the good category and 20-23 in the excellent category.

Table 3 In our study depicts grading of the attitude level amongst the participants which showed 0-1 % in the poor category, 2 % in the average category, 3% in the good category and 4% in the excellent category.

Table 4 In our study depicts distribution of correct answers regarding dental anxiety in children amongst the participants. Assessment was done to find out if dental anxiety education has to be given or not.. Where dental anxiety education to be given was emphasized, in the pre- education category there were 99% among 211 participants and 99.5 % among 212 participants in the post-education category. Where dental anxiety education to be given was not emphasized, in the pre- education category there were47.6 % among 102 participants and 97.2 % among 208 participants in the post-education category.

Table 5 In our study depicts the **distribution of primary school teachers according to the answers for method of dental anxiety education** amongst the participants which showed 116, with a % of 54.2 in the pamphlet category, 0 in the brochure category and 98 with 45.79% in the AV aids category .

Table 1: Gender distribution	N %
Female	81.3
Male	18.7

Table 2: Grading of knowledge level	
No of correct answers	**Interpretation**
0-9	Poor
10-14	Average
15-19	Good
20-23	Excellent

Table 3 : Grading of the attitude level	
No of correct answers	**Interpretation**
0-1	Poor
2	Average
3	Good
4	Excellent

Table 4:Distribution of correct answers regarding dental anxiety in children				
		Pre		**Post**
	N	%	N	%
Dental anxiety education should be given	211	99	212	99.5
Dental anxiety education should not be given	102	47.6	208	97.2

Table 5 : Distribution of primary school teachers according to the answers for method of dental anxiety education

Method of dental anxiety education	Pre	Pre	Post	Post
	N	%	N	%
Using pamphlets	116	54.2	204	95.30
Using brochures	0	0	0	0
Using A-V aids	98	45.79	10	4.67

Discussion

Children's emotional perspective can be moulded towards right dental attitudes when intervened at an early age before being influenced by peers, friends, parents and teachers. Thereby increasing the knowledge and attitude among primary school teachers would help in the long run which was achieved in our study.

Our study depicted the gender distribution of the participants among whom there were a considerable percentage among males and female teachers achieved.. This is in accordance with similar studies done by Hayward et al [1], Ayer et al[2] and Mostofsky et al [3.] who suggested the incorporation of gender distribution of participants for assessment. Our study depicts grading of the knowledge level amongst the participants. This is in accordance with similar studies done by Dalley et al [4,] Bowling et al [5] and Newton et al [6].

Our study depicts grading of the attitude level amongst the participants amongst the various categories. This is in accordance with similar studies done by MA Grath et al [7], Folayan et al [8] and Corah et al [9].Our study depicts distribution of correct answers regarding dental anxiety in children amongst the participants. Assessment was done to find out if dental anxiety education has to be given or not.This is in accordance with similar studies done by De Jongh et al [10], Venham et al [11] and Wong et al [12].

Our study depicts the distribution of primary school teachers according to the answers for method of dental anxiety education amongst the participants. This is in accordance with similar studies done by Buchanan et al [13,14] et al, Bhat et al [15] and Scarpeli et al [16.]Our study depicts the **distribution of** knowledge of primary school teachers before and after dental anxiety education amongst the participants

Our study depicts the distribution of attitude of primary school teachers before and after dental anxiety education amongst the participants. This is in accordance with similar studies done by Martins Junior et al [17] et al, Peker et al [18] and Barbosa et al [19] and Pahel et al [20].

Conclusion

Our study showed that there was a dearth of information regarding dental anxiety status among children before dental health awareness program which improved tremendously after the program among primary school teachers, which clearly indicates that more such programs can be planned and conducted in a larger scale. Thus it can cater to the needs of the society by way of Out Reach programs in combination with Health Education protocols.

Implications

1. Our study emphasized the focus areas for removing the stress involved in treating dentally anxious children in an exponential manner.

2. Analytical aspects of the survey will help the researchers to comprehend better.

3. The study design aims to cater to needs of the population at the community level.

Ethical Clearance: This study was a short project. Hence IEC could not be obtained, ethical issues were appropriately addressed as follows

1. Anonymity of subjects was ensured.

2. No pressure was exerted on the subjects to participate in the study and participation was completely voluntary.

3. Confidentiality of data was ensured. It was saved in password protected systems which had access only to investigators.

Declaration of Interests : The authors declare no conflicts of interest.

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Original Research Article

Validation of Early Childhood Dental Anxiety Impact Scale among 3-5 Year Old Preschool Children in Chennai City

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Abstract

Background: The early childhood dental anxiety impact scale (EC-DAIS) has been developed for assessing dental anxiety related quality of life (DAR-QoL) in pre-school children, which is then validated in the English language to confirm with their geographic locations.

Aim: The present study was undertaken to assess the validity of the English version among 3-5 year old pre-school children of Chennai city.

Methodology: The English version of EC-DAIS was developed. It was tested for validity and reliability among 469 parents and children after obtaining informed consent and assent.

Statistical Analysis : Construct validity was assessed by correlating EC-DAIS with FBRS-Frankl's Behavior Rating Scale. Internal consistency or reliability was determined by Cronbach's alpha. Test-retest reliability by ICC assessment was done and outcomes were measured.

Results: Construct validity was r=0.298.Reliability using Cronbach's alpha was 0.873. Test-retest reliability by Intra Class Correlation assessment was 0.91.

Conclusion: The English version of EC-DAIS is a valid instrument for assessing Dental Anxiety Related-Quality of Life (DAR-QoL) in pre-school children.

Keywords: Early childhood dental anxiety impact scale, dental anxiety related quality of life, pre-school children.

Introduction

Dental anxiety may have a negative impact on the functional, emotional and psychological well being of young children, leading to total voidance of dental care, which may have an indirect influence on the quality of life-QoL.[1] Qol is an individual's perception of life with regards to position in life, culture, value systems, goals, expectations and concern.[2-4] Assessment of DAR-QoL is important in young children as it can affect their growth, development, socializing capacity, self esteem and learning abilities.

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Dental anxiety has been measured traditionally using various scales in the past but it does not document the full impact with regards to quality of life. This led to the origin of the concept of EC-DAIS with regards to DAR-QoL to provide a complete picture of dental anxiety status in children.

EC-DAIS was developed to assess the impact of dental anxiety on QoL among pre schoolers-3-5 year old children. There were questions under the knowledge domain for parents in English language which was, checked by experts. The validity and reliability was also checked. Pilot testing was done on a group of representative samples before commencing the survey. The responses were rated using Likert scales ranging from 1-5.

Methodology

Study Design

A cross sectional descriptive survey was conducted among parents of 3-5 year old children. Official permission to conduct the study was obtained from school authorities. After explaining the purpose and details of the study informed consent and assent was obtained from parents and children.

Sample size calculation

Sample size calculated was calculated using G – Power software by taking values from a previous key article. It was based on confidence interval of 95% , 5 % margin of error and 90 % response rate. Final sample size was determined to be 469 taking into consideration a 20% loss of samples during the study.

Eligibility Criteria

Inclusion criteria:

Children who fall under the ASA category 1

Children present on the day of assessment

Children who were willing to participate.

Children with no past experience

Children who fall under Frankel Behavior rating of 2 or 3

Exclusion criteria:

Children with special health care needs

Children with underlying systemic conditions

Recruitment of Trial Participants

A total of 503 children belonging to the pre-school age group who reported to the dental office were screened for eligibility. From this,469 children met the inclusion criteria. The study procedure was explained, consent and assent forms obtained.

Data collection:

Data collection was done through the administration of the newly developed structured questionnaire for dental anxiety status. The collected data was entered into MS Excel and analyzed using SPSS version 20. (IBM Armonk, New York, USA) package. All possible efforts were made to address the potential source of bias.

Statistical Analysis

Reliability was assessed in two ways- Internal consistency and Test- Retest reliability. Internal consistency reliability was tested by assessing the mean item correlation of items within EC-DAIS using Cronbach's alpha co-efficient. Test-retest reliability was assessed by determining the level of agreement between initial and repeat assessments of EC-DAIS after one month by calculating intra-class correlation co-efficient –ICC in a one way random effect parallel model.

Convergent validity was assessed based on Spearman's rank order correlations between EC-DAIS scores and parental responses on the presence of dental anxiety among children and also EC-DAIS

scores with FBRS. Interpretation of correlation co-efficient was as follows:

Ø   r </=0.49-weak,

Ø   r </=0.50-moderate,

Ø   r </=0.74- strong relationship.

Construct validity was determined by correlating EC-DAIS scores with FBRS. The prior assumption was that FBRS scores have a moderate-high correlation with EC-DAIS scores.

Discriminant validity was evaluated by comparing EC-DAIS scores in children

with and without dental anxiety using Mann Whitney U test.

Results

Characteristics of children and parents from study population

All participants completed the trial and no attrition was seen. **Our study** showed the characteristics of children and parents from study population which includes age, gender, mother's occupation, socio-economic and dental anxiety status. It indicates the sample population along with the percentages. The variables assessed in this category comprised of children in the pediatric age groups of 3,4 and 5. Amongst them participants of four year age group showed the highest percentage (43.7%) In the gender category males were predominant (57.8 %) in comparison with females . In mother's education category two domains were assessed in terms of high school and above high school, of which the above high school category showed (85.7%)In mother's occupation category two domains were assessed in terms of employment, amongst which unemployed

category showed (73.8 %)In the socioeconomic category five domains were assessed in terms of status , amongst which upper class Grade A showed the highest of (67.4 %) In the dental anxiety category in terms of status mean FBRS score was (32 %) **Table 1**

Distribution of EC-DAIS based on Likert responses

Table 2 in our study showed the distribution of EC-DAIS based on Likert responses which includes associated dental pain, difficulty in drinking, eating, communication, disturbances in sleep cycle, frustrated emotions, avoiding eye contact, smiling, laughing, talking, missed school, family feeling guilty and financial constraints.

Score domain of EC-DAIS response

Table 3 showed the score domain of EC-DAIS. The items assessed were categorised into two domains namely child and parent totalling up to 13 characters along with mean and standard deviation of 1.79+/-4.018

Reliability Analysis

Table 4 showed the Reliability analysis for the child and parent domains. The number of items assessed were 13 with 9 in the child domain and 4 in the parent domain. Internal consistency was scored based on Cronbach's alpha and Test- Retest reliability was scored based on Inter class correlation.

Discriminant Validity

Table 5 showed the Discriminant Validity for the dental anxiety status under present, absent and total categories. It tests if unrelated concepts are truly unrelated.

Table 1: Characteristics of children and parents from study population

Variable	N%
Age (years)	
3	121 (25.8)
4	205 (43.7)
5	143 (30.5)
Gender	
Male	271 (57.8)
Female	198 (42.2)
Mother's education	
High school	63 (13.4)
Above high school	402 (85.7)
Mother's occupation	
Employed	119 (25.3)
Unemployed	346 (73.8)
Socio economic status	
Upper class	35 (7.5)
Upper class- Grade A	316 (67.4)
Upper class - Grade B	97 (20.7)
Lower class- Grade A	19 (4.1)
Lower class –Grade B	2 (0.4)
Dental anxiety	
Present	150 (32)
Absent	319 (68)
Mean FBRS score	1.085+/ -2.269

Table 2: Distribution of EC-DAIS based on Likert responses

	Likert- 1	L2	L3	L4	L5	L6
Associated dental pain	382 (81.4)	39 (8.3)	39 (8.3)	5 (1.1)	-	4 (0.9)
Difficulty in drinking	430 (91.7)	21 (4.5)	11 (2.3)	4 (0.9)	-	3 (0.6)
Difficulty in eating	427 (91.0)	17 (3.6)	17 (3.6)	4 (0.9)	1.(0.2)	3 (0.6)
Difficulty in communication	436 (93.0)	17 (3.6)	8 (1.7)	2 (1.4)	-	6 (1.3)
Disturbances in sleep cycle	440 (93.8)	9 (1.9)	16 (3.4)	1 (0.2)	-	3 (0.6)
Frustrated emotions	424 (90.4)	18 (3.8)	18 (3.8)	4 (0.9)	1.(0.2)	4 (0.9)
Avoids eye contact	446 (95.1)	6 (1.3)	9 (1.9)	2(0.4)	-	6(1.3)
Avoids smiling	449(95.7)	10(2.1)	4(0.9)	-	-	6 (1.3)
Avoids laughing	441(94)	12(2.6)	11(2.3)	1(0.2)	-	4(0.9)
Avoids talking	388(82.7)	30(6.4)	43(9.2)	5 (1.1)	1(0.2)	2(0.4)
Missed school	411(87.6)	21 (4.5)	19 (4.1)	2 (0.4)	4(0.9)	12 (2.6)
Family feeling guilty	419(89.3)	24 (5.1)	21 (4.5)	1(0.2)	1(0.2)	3 (0.6)
Financial constraints	430(91.7)	22 (4.7)	9(1.9)	3 (0.6)	2 (0.4)	3 (0.6)

Table 3: Score of domain of EC-DAIS

Impacts	Number of items	Possible range	Minimum	Maximum	Mean +/-SD
CIS	9	0-36	0	21	1.05 +/- 2.714
Child symptom	1	0-4	0	3	0.28 +/- 0.658
Function	4	0-16	0	9	0.42 +/- 1.254
Psychology	2	0-8	0	6	0.24 +/- 0.829
Child's self image and social interaction	2	0-8	0	4	0.10 +/- 0.504
FIS	4	0-16	0	11	0.74 +/- 1.782
Parental distress	2	0-4	0	7	0.46 +/- 1.096
Family contribution	2	0-4	0	5	0.28+/- 0.845
Total	13	0-52	0	27	1.79+/- 4.018

Table 4: Reliability analysis

EC-DAIS- No of questions	Internal Consistency Cronbach's alpha	Test retest reliability-ICC
Child-9	0.850	0.90
Parent-4	0.777	0.60
Total 13	0.873	0.91

Table 5: Discriminant Validity

Dental anxiety status	EC_DAIS score in parent domain	EC- DAIS score in child domain	EC- DAIS score
Present	1.14+/-2.329	1.91+/- 3.666	3.05 +/- 5.474
Absent	0.55 +/- 1.422	0.65 +/- 2.009	1.19 +/- 2.009
Total	0.74 +/- 1.782	1.05 +/- 2.714	1.79 +/- 4.018

Discussion

The present study evaluated the properties of the English version of EC-DAIS like knowledge, trust, behaviour, patterns and trends. It determines the validity and reliability using discriminant validity, internal consistency and test re-test reliability which is an essential component for cultural adaptation of any measure of quality of life. They record events occurring as a single snapshot. Studies assessing validation of quality of life scales enrol potential participation of children from schools, hospitals or community settings. Regarding validation from Jabarifer et al, Li et al and Lee et al enrolled participants from the community basis. Hospital based settings generally represent the picture from the tip of the iceberg.[1-3]

In the present study, EC-DAIS was constructed in the English language. Word modifications were done for a majority of questions and all items were retained from the original version and none of the items were deleted. [4-9] A series of words were replaced by a single synonym, focussing on the aspect to retain the concept. The modifications were based on linguistic and ethnic considerations. The modifications focussed to improve content validity and thereby to reduce false negative responses

Oliveira and Nadanovsky replaced "pain in the mouth "by tooth ache while validating the Brazilian version of OHIP.[4] Wong et al [5] replaced "self – conscious by "worried" in the Chinese version of OHIP.

The reliability analysis of EC-DAIS quality of life score sheet showed 0.850 in the child category, 0.777 in the parent category and 0.873 in the total category, which was well above the standards recommended for strong internal consistency (0.7-0.9) by Cronbach's alpha.[10-13]. It also indicates the link between the number of items and the homogeneity of the constructs and in turn the homogeneity of the population.

The inter- class correlation in the child category was 0.90, in the parent category was 0.60 and the total was 0.91, which is again within the recommended standards. Limitations inherent and pertaining to cross-sectional studies like not being able to assess the causal relationships were present in this study.

Conclusion

The English version of EC-DAIS is a reliable and valid tool for assessing the DARQOL- Dental Anxiety Related Quality of Life among children in Chennai city. The use of this scale could help clinicians, researchers and policy makers to interpret the dental anxiety related issues. It can help the family members to plan their children's dental treatment challenges accordingly. It can help to compare and evaluate the anxiety status among children. Further studies need to be planned and conducted in future to compare and evaluate the characteristics of dental anxiety.

Ethical Clearance: This study was a short project.

Hence IEC could not be obtained, ethical issues were appropriately addressed as follows

4. Anonymity of subjects was ensured.

5. No pressure was exerted on the subjects to participate in the study and participation was completely voluntary.

6. Confidentiality of data was ensured. It was saved in password protected systems which had access only to investigators.

Declaration of Interests : The authors declare no conflicts of interest.

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Psychosocial Workplace Factors and Health Problems among Indian Migrants in Gulf Cooperation Council Countries

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Abstract

Background: There are not extensive studies about psychosocial occurrence of work related health problems in the Indian migrants in GCC countries. The present study was intended to determine the work related psychosocial health problems and its consequences among the workers.

Methodology: This was cross sectional study and conducted in Warangal district, India. It involves male migrants of low and semi-skilled from six countries of the GCC. The questionnaire adopted from previous literature and consists of elements related to characteristics of demographic, psychosocial workplace factors including health related. The questionnaire was interviewed and was adopted in English. Data was analyzed using SPSS statistics.

Results: In total 410 migrants were included and 70.5% of them are married. Greater number of the respondent's migrants were construction laborers (25.4%). Reported high prevalence of physical strain (58%), lengthy standing (97.8%), lengthy sitting (65.6%), lifting and carrying (65%). Interestingly reported, 70% of them work in the same physical position for a lengthy period of time. Half of the migrant workers required a lot of thinking at their work and reported (75%) their work is too difficult. The study found 81% of migrants having good prospects with their employer. However, 72% reported their private life is suffering due to irregular working hours such as shifts or overtime and 66% do not have fixed working hours. Mechanical vibrations (68%) and raising voice (44%) affect their health. Almost all migrants suffering from dry and damp air including dust and accidents which are the highest factor at the workplace reported. Diseases reported are diabetes, cardiovascular, hypertension and metabolic arthritis suffering among workers.

Conclusions: The study emphasizes implementing various strategies or policies related to the workplace intended to improve work environment characteristics including psychosocial work factors to avoid work related health problems.

***Keywords:** GCC countries, Health problems, Migrants, Psychosocial, workplace*

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Introduction

India is one of the largest countries of origin of international migrants and around 70% of these are estimated to be labour migrants[1]. Due to the "oil boom" in Gulf Cooperation Council (GCC) countries, migration from Indian states like Kerala, Tamil Nadu,

Uttar Pradesh, Bihar, Telangana and Andhra Pradesh increased economies in these states due to remittances sent by the migrants' workers. These huge bulk of the migrant population are usually unskilled, low skilled and semi-skilled[2]. They are playing a very significant role not only to the host countries (GCCs) but also have major developmental contributions to the place of origin. Within the GCC countries, Kingdom of Saudi Arabia and United Arab Emirates are the most popular destinations of Indian immigrants and together they contributed more than 60 per cent of the total deployment of Indian migrant workers[3].

Migration impact is increasingly being recognized in global public health agendas. With the increase in immigration comes many concerns, such as the health of immigration in their selected host countries. Migrant workers are at high risk for hazardous occupational exposures, injuries and even death in the host countries. These workers work in the "3Ds" category classified as dangerous, dirty and degrading that the host countries' workers are unwilling to perform[4,5]. There is evidence that many migrants when arriving to the host country were healthy but that good health can deteriorate over time in the receiving society[6]. Due to the rejection of jobs by local workers, low skilled workers are working under risk pone jobs that led to serious health problems among Indians and can be an important source of occupational health inequalities. The employment conditions and associated work at the workplace of blue collar migrant workers are dangerous which are evident from many studies[4,7]. At present, the lack of evidence related to the health problems of the migrant laborers might be one of the problems that the host governments were not able to focus on Indians in GCC countries.

It is reported that psychosocial factors such as stress, hostility, depression, hopelessness, and job control seem associated with physical health, particularly heart diseases[8,9]. Work related stress associated with psychosocial factors are among the greatest challenging issues in occupational safety and health. They impact significantly on the health of individuals, organizations and national economies[10]. Therefore, the present context of study is to determine the psychosocial work related health problems pertaining to migrant work place. The findings of the present study will contribute to a better understanding by health personnel of the health status profile of migrant workers and allow for the development of stress-prevention programs for these workers.

Methodology

The present study is cross sectional and the data was collected for a period of five months in 2019. The current study was conducted in Warangal district, Telangana, India and received ethical approval from SRM Institute of Science and Technology, Chennai. In total 410 were randomly recruited out of 498 participants with the response rate of 82.33%. The study involved male migrants of low skilled and semi-skilled workers from six countries of gulf cooperative councils (GCC) namely Saudi Arabia, United Arab Emirates(UAE), Qatar, Oman, Bahrain and Kuwait. Females are excluded and only male migrants were recruited in the current study. The ID of migrant workers were checked for the verification of the country and their workplace. All participants signed informed consent. The researcher filled a questionnaire survey based on the interview with the verbal response from the migrants of low skilled and semi-skilled as they are mostly unable to read and write. Physical examination and laboratory tests were excluded and the questions were based on the interview only. Inclusion criteria is that of one-year experience and must be between 20 to 60 years of age. The questionnaire was adopted and modified from the published literature[5,11,12]. The questionnaire was adopted only in English and no other bilingual language was used. Three main sections were included in the survey namely demographic,

general psychosocial characteristics of health with regard to work and workplace and migrants work related diseases. To measure various outcomes three Likert type scales never, sometimes and often, were used. The data was summarized in frequencies and percentages including chi-square test was carried out to measure the statistical significance. The analysis was performed using SPSS software version 20.

Results

A total of 410 migrants of low skilled and semi-skilled were included in the analysis. Most of the migrants were married (70.5%). The majority of them were between 31 to 40 years of age (40.7%). In terms of education level, 27.8% and 46.8% had primary and secondary education levels respectively. Majority of the participants were from Saudi Arabia (44.63%) followed by UAE (24.63%). Greater number of the respondents were employed as construction labour (25.4%) (Table 1).

Table 1. Demographic characteristics of the participants.

Characteristics	N	%	Characteristics	N	%
Age			Countries		
20-30	73	17.8	Saudi Arabia	183	44.63
31-40	167	40.7	UAE	101	24.63
41-50	94	22.9	Qatar	57	13.90
51-60	27	6.6	Oman	28	6.83
>60	49	12.0	Bahrain	18	4.39
Marital Status			Kuwait	23	5.61
Unmarried	93	22.7	**Employment in GCC Countries**		
Married	289	70.5	Plumber	17	4.1
Widowed	5	1.2	Carpenter	16	3.9
Divorced	23	5.6	Painter	25	6.1
Residing in gulf countries			Plasterer	14	3.4
1-5 Years	75	18.3	Bricklayers	13	3.2
6-10 Years	198	48.3	Retail Sales personal	42	10.2
11-15 Years	70	17.1	Driver	43	10.5
16-20 Years	15	3.7	Laundry operator	14	3.4
>20 Years	52	12.7	Cleaner	36	8.8
Education Level			Construction labor	104	25.4
Primary Level (1 to 10)	114	27.8	Workshop mechanic	18	4.4
Secondary Level (10+2)	192	46.8	Cook (Chef)	15	3.7
University Level	40	9.8	Electrician	3	0.7

Cont... **Table 1. Demographic characteristics of the participants.**

None	64	15.6	Technician	0	0.0
			Gardener	1	0.2
			Industrial worker	29	7.1
			Barber	4	1.0
			Other	16	3.9

This survey found that 57.5% had a highly physical strain working environment. With regards to lengthy sitting (65.6%) and lengthy standing (97.80%) and lifting or carrying at 65% sometime reported among migrants. Approximately 70% reported lengthy periods of working in the same physical position and repetitive movement. Nearly 50% of the migrants reported required a lot of thinking during their work. Interestingly, 75% found that their work is too difficult. A greater number of them (98%) need to spend a lot of time being alert and have to work with a deadline (Figure 1).
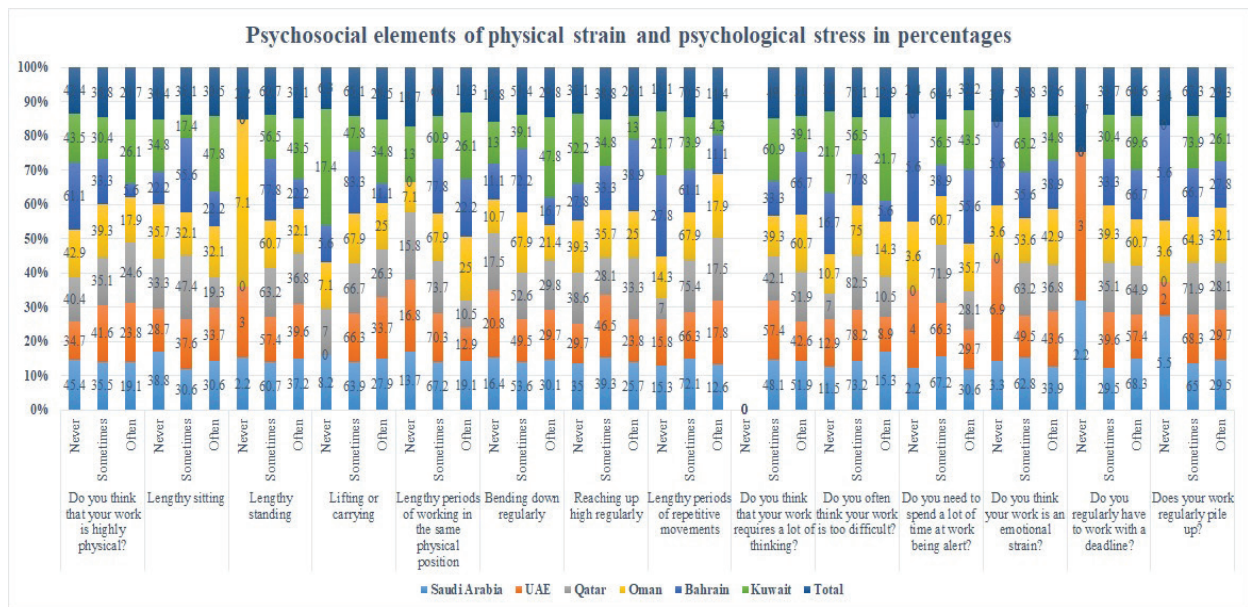
Figure 1 Psychosocial elements of physical strain and psychological stress in percentages.

Half of the participants 57% agreed that their job often provides sufficient security and 81% reported having good prospects with their employer. Interestingly, reported 66% do not have fixed working hours. The study reported 36% of migrants cannot take a break when needed and found slight differences between GCC countries (p=0.079). The most important finding is that 72% reported their private life is suffered due to irregular working hours such as shifts or overtime (Figure 2).
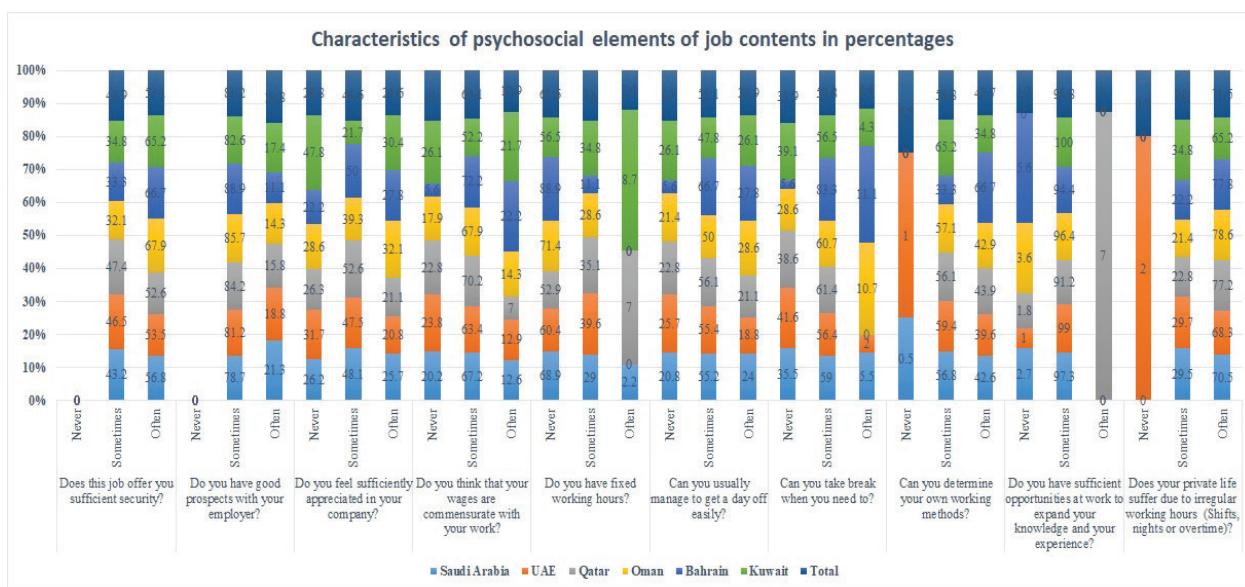
Figure 2. Characteristics of psychosocial elements of job contents in percentages

The study reveals 44% of the participants have to raise their voice in order to be heard. Majority of them (68%) sometimes suffer during their work from the effects of mechanical vibrations or shocks. Approximately 70% of migrants reported distress due to change in temperature during work. However, almost all migrants reported to suffer from dry and damp air. Nearly 26% have to suffer from light and lighting during work and found statistical significance (p=0.006). Interestingly the study reported that almost all the workers have to suffer the dust. One of the interesting findings reported that almost all migrants have undergone some sort of accident or near misses even with enough attention paid to preventing accidents (Figure 3).

Figure 3. Psychosocial factors at workplace and safety in percentages

The present study showed diabetes highest among construction labor (29%) and painters (13%). Cardiovascular diseases and hypertension reported among construction workers (20.3%; 24.5%) and retail sales (13%; 12.2%) respectively. Hyperlipidemia reported highest in painters (18%) followed by cleaner and construction labor (13%). Majority of metabolic arthritis and gastric ulcer among construction labor 22% and 36% respectively. In overall, one of the key findings is that the construction labor 23% are most affected with various diseases followed by retail sales and drivers (11.0%) (Figure 4).
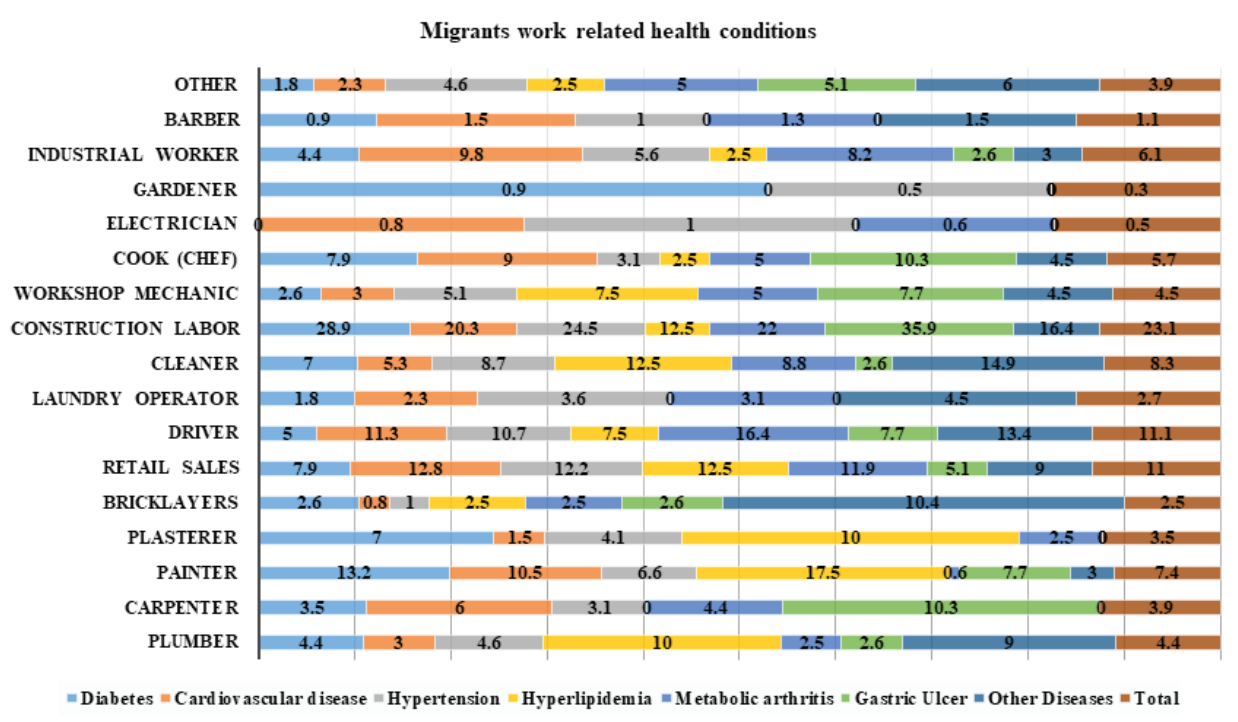
Figure 4: Migrants health conditions in percentages with regards to employed.

Discussion

Physical Strain and Psychological stress

In this study high prevalence of physical strain was reported among the migrant workers. Probably this physical strain can be explained by lengthy standing, lengthy sitting, lifting and carrying as reported by the workers in the current study. In addition, 70% of them work in the same physical position for a lengthy period of time. These results evident the strong relationship between their working condition and health. The physical strains due to work positions, different act of movements and use of excessive forces together put strain on the musculoskeletal system. If these movements are not done correctly, it can lead to migrants' health over time and possibility of serious injuries. The current results strongly support similar findings that the physical strain and its exertion has a significant impact on work ability among workers[13,14]. In another study reported musculoskeletal pain most frequently perceived through work related environments among the municipality workers[12]. Globally, migrant workers are at considerable risk of negative occupational exposures leading to poor health outcomes and workplace injuries impacting overall health[15,16].

The results of the current study identified that half of the migrant workers required a lot of thinking at their work and reported (75%) their work is too difficult. In addition, these workers reported (98%) spend a lot of time being alert and work with the given deadline (Figure 1). Our study results are inconsistent to the similar study finding reported 62.2% of work related stress among white collar migrant workers [5]. These results are evident and demonstrate a psychological stress among migrant workers. It is reported that psychological stress is commonly believed to play an important role in illness and premature death[17]. These low skilled workers show an increase in the incidence of serious, psychotic, anxiety and post-traumatic disorders due to a series of socio-environmental variables, such as loss of social status, discrimination, and separations from the family[18].

Job Content

With regards to job content, the study found 81% having good prospects with their employer. Similar results reported that nearly 60% of workers have supportive bosses and good friends at work[19]. Believed that migrant workers have greater productivity and that enjoys a better job and mobility in the labor market[20]. These study results indicate that Job prospects can be excellent for a variety of reasons, strong employment growth and good prospects for advancement. Reported (72%) their private life is suffering due to irregular working hours of shifts or overtime and 66% do not have fixed working hours(Figure 2). Results strongly support that the irregular shifting times have greater work stress and health-related issues reported to arise from work-life conflict[21,22]. Significantly, long working hours or undesirable working hours had negative effects on health such as fatigue, physical symptoms and psychological wellbeing[23, 24].

Factors at workplace

Factors at workplace such as raising voice and effects of mechanical vibrations affect their health were reported. Because of the mechanical vibrations especially in the constructions or industrial sectors, the workers need to raise their voice constantly to be heard.Similar study reported that occupational exposure to shock and vibration is a factor increasing the incidence of low back pain among workers[25]. Neurological and osteoarticular systems are the signs of disorders due to prolonged exposure to vibration and shocks[26].The study disclosed that workers suffer from dry and damp air.The temperatures and humidity differ between the coastline and desert within regions of GCC. Dry and damp air has the ability to worsen a wide range of health issues such as respiratory conditions, skin problems, eye itching and allergies[27, 28]. The study showed all migrants are suffering from dust and found significant association (Figure 3). Results endured the similar findings which reported greater exposure to dust among immigrant workers at risk of occupational disease[29, 30].One of the key findings reported all migrants have undergone some sort of accident or near misses. Numerous studies have found that migrant workers are more vulnerable to accidents at their workplace[31-34]. As a result, it is strongly recommended to follow appropriate guidance for the safety management of migrant workers because incidents might cause life-long disability.

Migrants health problems

The current results disclosed the highest number of chronic diseases and health problems among half of the migrants suffering more than one health issue during their stay in gulf countries. In overall, the construction labor is most affected with various diseases followed by retail sales and drivers. The present study showed diabetes highest among construction labour and painters. Cardiovascular diseases and hypertension reported among construction workers and retail sales. Hyperlipidemia reported highest in painters and cleaners (Figure 4). The study revealed the majority

of metabolic arthritis and gastric ulcer among construction labor. These chronic diseases reported in the current study are similar as well as higher in the general migrant's population[5, 35, 36]. Further studies reported the burden of communicable and non-communicable diseases among migrants and refugees which are resembling results to chronic diseases reported in the current study[37, 38]. The explanation for these health reasons is that the migrants are neglecting to participate in preventive care or possible delay in treatment process. In other studies, reported migrant's health status is better at arrival but rapidly decreases with increased length of stay in the host country[39, 40]. The other factors that resulted in their chronic health conditions could be dangerous working conditions, and poor salaries which are damaging the quality of life of migrants[41, 42]. The study recommends public health programs in the host countries provide adequate support for migrants with chronic health conditions or related symptoms that greatly enhance their good health. In addition, screening and evaluating for chronic conditions in the earlier detection can yield substantial savings and better health outcomes among migrants.

Limitations

The results in this study cannot be attributed to the whole migrant population as it was executed in a single district in India. The study reported the majority of migrants are from Saudi Arabia and United Arab Emirates (UAE) which does not equally result in migrants responding from other GCC countries. In spite of these limitations, the study provides certain important outcomes with regards to working conditions and health problems which host countries can provide adequate support to migrants.

Conclusions

The findings suggest important messages about migrants concerning working conditions and their health problems in the host countries. The results emphasize that a considerable portion of health problems were attributed to prolonged working conditions including workplace factors among unskilled or skilled migrants. The results also indicate a large potential for prevention by reducing reported risk factors in the workplace to avoid work related health problems. Therefore, study stress upon implementing various strategies or policies to protect the health and well-being of migrants. Furthermore, employers recognize psychosocial work-related stress among workers as a significant health and safety issue through consistent actions.

Ethical Clearance: Obtain from Institute.

Conflict of Interests: None.

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Qualitative Single Base Extension Assay for Identification of Single Nucleotide Polymorphism in Mumps Virus Genome

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Abstract

Objective: Objective of the study was to standardize and evaluate suitability of Single Base Extension (SBE) singleplex assay for rapid routine monitoring of genetic homogeneity of virus samples, from productivity improvement experiments in Mumps vaccine. A Single Base Extension assay is a simple, cost effective tool for quick identification of single nucleotide polymorphism (SNP) at the three known sites in Mumps vaccine virus genome. The assay can be developed as a singleplex or multiplex version with potential for detection of up to ten SNP bases in a single reaction.

Methods: SNaPshot kit from Applied Biosystems (ThermoFisher) was used to identify the nucleotide bases at the three SNP sites in Mumps virus genome. Approximate sizing locations of individual primers were determined using the SNaPshot Primer Focus Kit, also from Applied Biosystems. Genetic analyzer 3500 was used for the capillary electrophoresis of the processed samples. Results obtained from the data collection software were analyzed using GeneMapper software.

Findings: Nucleotide G was identified at locations 1073 and 11345 and nucleotide C was identified at location 5261 for all tested mumps vaccine samples, thus demonstrating consistency in genetic homogeneity at the three known SNP hotspots in experimental mumps vaccine virus samples.

Conclusion: The singleplex SBE assay was found to be a reliable and relatively inexpensive tool for routine monitoring of genetic homogeneity of vaccine virus samples, with potential for multiplexing that would reduce the cost and assay time even further.

***Keywords:** Mumps virus, Primer Focus Assay, SBE assay, Singleplex, SNP sites*

Introduction

Regulatory organizations are expecting from biological industries, increased usage of molecular methods for ensuring consistency in critical quality attributes of biological products such as live attenuated

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vaccines. Consistent performance of live attenuated viral vaccines is critical from safety and efficacy point of view. Polymerase chain reaction (PCR) based advanced molecular methods are already being used as batch release criteria for oral polio and influenza vaccines.[1]

Both qualitative and quantitative molecular methods are useful in quality check of vaccines. Qualitative methods supported with adequate validations are simple and readily doable for routine

genetic monitoring of homogeneity of viruses.

On the other hand, complicated techniques such as Mutant Analysis by PCR and Restriction Enzyme Cleavage (MAPREC) and Matrix-assisted Laser Desorption/Ionization – Time of Flight (MALDI-TOF) have been used for analyzing dynamism in mutant profile of Jeryl Lynn mumps vaccine virus.[2]

Consistency in the quality of experimental vaccines can be effectively monitored, if a simple and quick genetic tool such as the SBE assay can be standardized.

Single base extension, as the name indicates, extends the annealed primer by only one nucleotide before getting terminated because of the presence of dideoxynucleotides (ddNTPs) instead of the usual deoxynucleotides (dNTPs) in the reaction mixture. The ddNTPs present in the reaction mixture are fluorescently labeled, each one having its unique identifiable color.

SNP genotyping can be used for identifying mutations. Single base deletions, additions or replacements can be quickly captured using this technique. Useful features of SBE and its comparison with real time PCR and next generation sequencing have been reported.[3-5]

In this study, we have described an application of the simplest form of this assay for identification of nucleotides at the known SNP locations of mumps virus passaged on different cell substrates.

Mumps virus is an enveloped RNA virus having non-segmented single stranded RNA of negative polarity as a genome. Its genome length is 15384 nucleotides which sequentially represent the seven genes, viz. NP, V/I/P, M, F, SH, HN and L gene.[6]

Kosutic-Gulija et al first reported the genetic heterogeneity of the L-Zagreb mumps vaccine virus.[7] The first site was reported in the Nucleocapsid (NP)

gene at position 1073, represented as G1073T. The second site, in F gene was represented as C5261T and the third site being G11345T in the L gene of the virus.

In this study, the virus was passaged multiple times on three different cell substrates viz. HDC, Vero cells and Chicken Embryo Culture (CEC) cells, including a plaque purification passage.

First and the last passage samples were then genetically analyzed for the identification of the nucleotide present at the three known SNP locations, using the SBE assay.

RNA viruses like the mumps virus are known for their high rate of mutations because of non-availability of proof reading mechanism. Therefore it was interesting to find out, whether the changed cell substrate results in mutations at least at the known hotspot SNP sites.

Sequencing of the entire genome may not be feasible always. Hence a technique such as SBE can be a useful firsthand tool for primary analysis in determining genetic homogeneity.

Materials and Methods

Materials

Biological materials such as Mumps vaccine virus, HDC, CEC and Vero cells were available in-house.

Cell Medium, Minimum Essential Medium with Hank's Salts & L-Glutamine was from

Invitrogen, USA. It was supplemented with 10% Fetal Bovine Serum from Morgate, Australia.

Tissue Culture Flasks were from Becton Dickinson and 96 well plates were from Corning Inc, USA.

Shrimp Alkaline Phosphatase was from USB

Corporation, USA.

DNase, RNase and pyrogen free microcentrifuge tubes and micropipette tips were procured from Eppendorf, Germany and PCR Tubes were obtained from Axygen Inc, USA.

RNA extraction kit, QIAMP Mini RNA kit catalog no. 52906 and PCR purification kit, catalog no. 28106 were from QIAgen, Germany.

AccessQuick RT-PCR system, catalog A1702 was from Promega.

SNaPshot multiplex kit, catalog no. 4323161, Primer Focus Kit, Catalog no. 4329538 and GeneScan120 Liz Size Standard, Catalog no. 4324287 and Hi-Di Formamide were from Thermo Fisher USA.

Designed Primers were synthesized from Sigma Genosys.

Virus growth and extraction of RNA

Four consecutive passages of the L-Zagreb mumps virus, including one plaque purification passage were performed on each of the three cell substrates, viz; HDC, Vero cells and CEC.

Briefly, monolayers of the respective cells in TCFs were infected with preceding passage virus and infected cultures were incubated at $33 \pm 1^{\circ}C$ temperature. Multiple harvests were collected at predefined intervals. Homogenized virus pool was prepared from all the harvests which was titrated and stored at $-60^{\circ}C$.

RNA was extracted from all the homogenized virus pool samples using QIAgen Mini RNA extraction kit as per the instructions provided in the kit. Briefly, heat inactivated virus samples were first lysed with the lysis buffer, loaded onto the spin columns, washed twice using the wash buffer and finally eluted with the elution buffer from the kit. All the purified RNA samples were appropriately labeled and stored at $-60^{\circ}C$ till further use.

Preparation of DNA amplicons and SBE assay

Promega's single tube RT-PCR AccessQuick system was used to prepare cDNA from the RNA templates using random hexameric primers. For the preparation of amplicons, gene-specific primers for the NP gene, F gene and L gene covering the SNP sites were designed and used. Refer Table 1 for the list of primers designed.

Table 1: Details of primers designed and their properties.

Primer Name	5'à 3' Sequence	Nucleotides	GC %
N-F	GCCTTCTTTCTCACCCTCAA	20	50
N-R	GTACCGACTCCCATAGCATAAC	22	50
*1073-F	ATCGAGGTCTCGGAGAACAA	20	50
*1073-R	CAACAAAGCAAGGTATCTGG	20	45
F-F	GGATAACCAGCTTGCAACTTTC	22	45.5
F-R	CCATTAGACCGGCACTTAGTATC	23	48
*5261-F	TGACGCCTGCAGTGGTTCAAGCAA	24	54.2
*5261-R	GCAGCAGAAATTGAAGTAGATAAT	24	33.3
L-F	TCATGTAGTCGCCTGTTCAATA	22	40.9
L-R	CTCCACGAAGCATGGGATTA	20	50
*11345-F	AGACCCATTAGTGTCTGCAATTGCTGAT	28	42.9
*11345-R	AGACAGCCAGCCTTAATTAATCGTTTCA	28	39.3

*Nucleotide position in Mumps genome, -F: Forward primer, -R: Reverse primer

The above primer pairs were designed using online primer design tools. The primers were aligned with the consensus sequence of the L-Zagreb mumps virus downloaded from the NCBI GenBank Accession No. AY685920.

Individual amplicons were prepared in separate reactions. Briefly, reverse transcription of RNA was done using AMV reverse transcriptase, followed by PCR amplification with AccessQuick Master Mix and corresponding primer pairs, as shown in Table 2.

Table 2 : Details of reaction set up and processing conditions used for single tube RT-PCR.

Sr. No.	Reagent	Quantity (μL)	RT-PCR Conditions	Temperature (oC)	Time (minutes)
01	Master Mix	30.0	Reverse Transcription	45	45
02	Purified Water	17.1	Initial Denaturation	95	2
03	Gene-Specific Forward Primer	2.7	Cyclic* denaturation	95	0.3
04	Gene-Specific Reverse Primer	2.7	Cyclic* annealing	60	0.5
05	Reverse Transcriptase	1.5	Cyclic* extension	72	0.5
06	RNA template	6.0	Final Extension	72	5.0
	Total	60.0	Storage	4 or -20	∞

*Cyclic: 50 cycles.

SBE assay was performed using SNaPshot multiplex kit to identify the bases at the 3 known SNPs sites, the details of which are listed in Table 3 below.

GeneMapper version 5 software was used for the analysis of the electropherograms. Internal sizing standard GeneScan 120 LIZ was included in each sample. The samples to be tested were loaded into 96 well plates. The 8 capillary array of the instrument took a run time of less than 20 minutes for analyzing 8 samples in a column simultaneously.

Table 3 Details of reaction set up and processing conditions used for SBE Assay.

Sr. No.	Reagent	Quantity (μL)	Temperature (oC)	Time (second)
01	*RRM	5.0	---	---
02	SNP-specific Primer	1.0	96	10
03	Gene-specific Amplicon	3.0	50	5
04	Purified Water	1.0	60	30
Twenty Five cycles of the above 3 steps are performed and then the PCR product is held at 4oC until the next step of post-reaction clean up.				
05	Reaction Mixture	10.0	37	60
06	Shrimp Alkaline Phosphatase	1.0	72	15
Store at 4oC until loading for capillary electrophoresis.				
07	HiDi Formamide	9.0	---	---
08	GeneScan 120 LIZ Size Standard	0.5	---	---
09	Cleaned up PCR Sample	0.5	95	5
Load for Capillary Electrophoresis.				

*Ready Reaction Mix: It contains fluorescently labeled ddNTPs, reaction buffer and AmpliTaq DNA polymerase.

Validation of SBE assay

Performance consistency of the SBE assay was checked through resolution of primers and its sensitivity, linearity and reproducibility. Resolution of individual SNP-specific primer was first checked using the Primer Focus Kit as per the kit instructions.

Reproducibility was checked by running a primer focus assay on duplex primers, i.e. the shortest and the longest primers were combined in one reaction.

Linearity of the assay was checked by running 3 serial double dilutions of the original sample. Sensitivity was evident from the results obtained for the low titer mumps virus grown on Human Diploid Cells (HDC).

Results

Results of Virus growth and RNA extraction

Virus content for HDC-mumps ranged from 2.1 to 2.7 log $CCID_{50}$ per 0.5 ml over the 3 consecutive passages. That for Vero-mumps ranged from 4.3 to 5.4 log $CCID_{50}$ per 0.5 ml and for CEC-mumps, it was from 5.7 to 6.5 log $CCID_{50}$ per 0.5 ml.

Thus, Comparison of last passage virus content revealed almost 2.5 log more virus in Vero-mumps than HDC-mumps and 1.1 log more virus in CEC-mumps than in Vero-mumps reflecting different degrees of adaptation on different cell substrates.

Results of preparation of DNA-amplicons & SBE assay

Gel electrophoresis of gene-specific amplicons revealed sizes of around 200 to 300 basepairs, which were purified and sequenced. More than 99% identity with L-Zagreb mumps sequence (GenBank Accession No. AY685920) was obtained for Vero-mumps and CEC-mumps partial sequences blasted at NCBI, whereas for HDC-mumps, it was more than 84 % identity.

SBE results indicated presence of only variant A population for all the samples because nucleotide G was detected at SNP-1 and SNP-3 locations whereas nucleotide C was detected at SNP-2 location.

Representative results of SBE assay for the last passage of CEC grown mumps virus for all the three SNP hotspots are shown in Fig.1. Black peaks were observed for SNP-1 and SNP-3 as seen in fig. 1 (a) and (c), whereas blue peak was observed for SNP-2 as seen in fig. 1(b).

Fig.1. Results of SBE assay

Fig. 1(a) Peak detected at SNP-1.
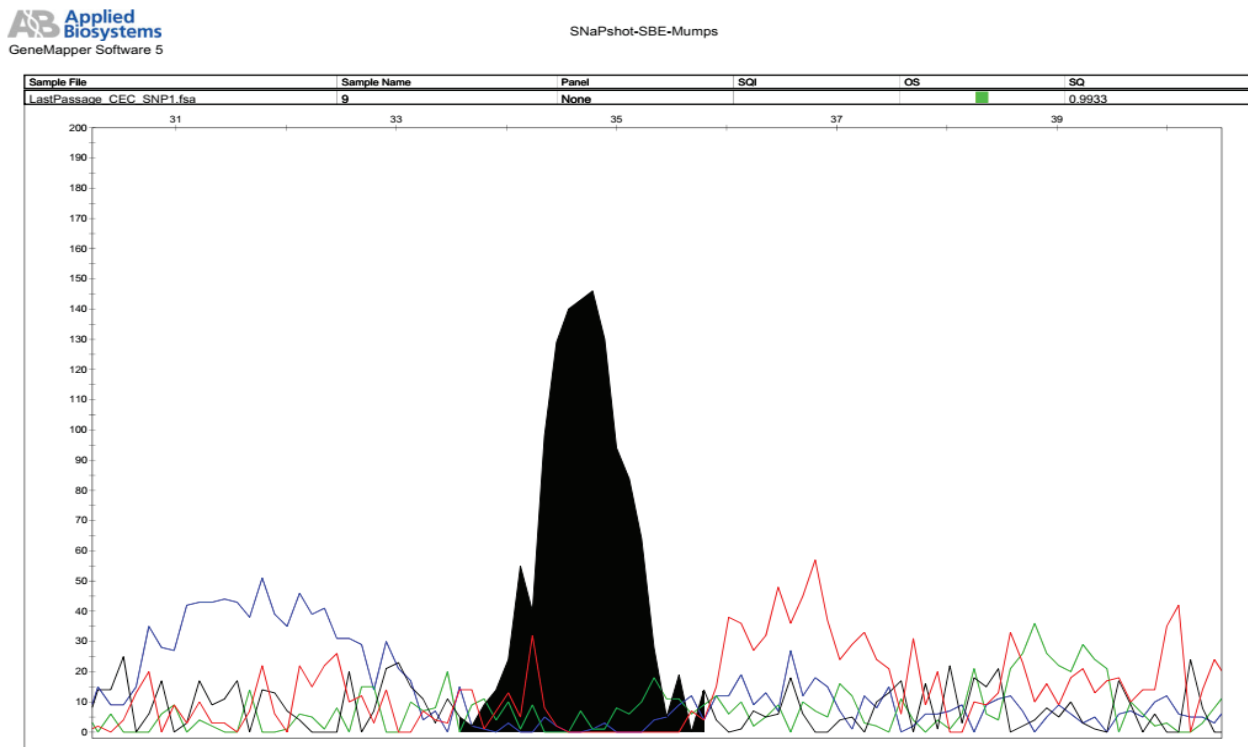
Fig. 1(b) Peak detected at SNP-2.
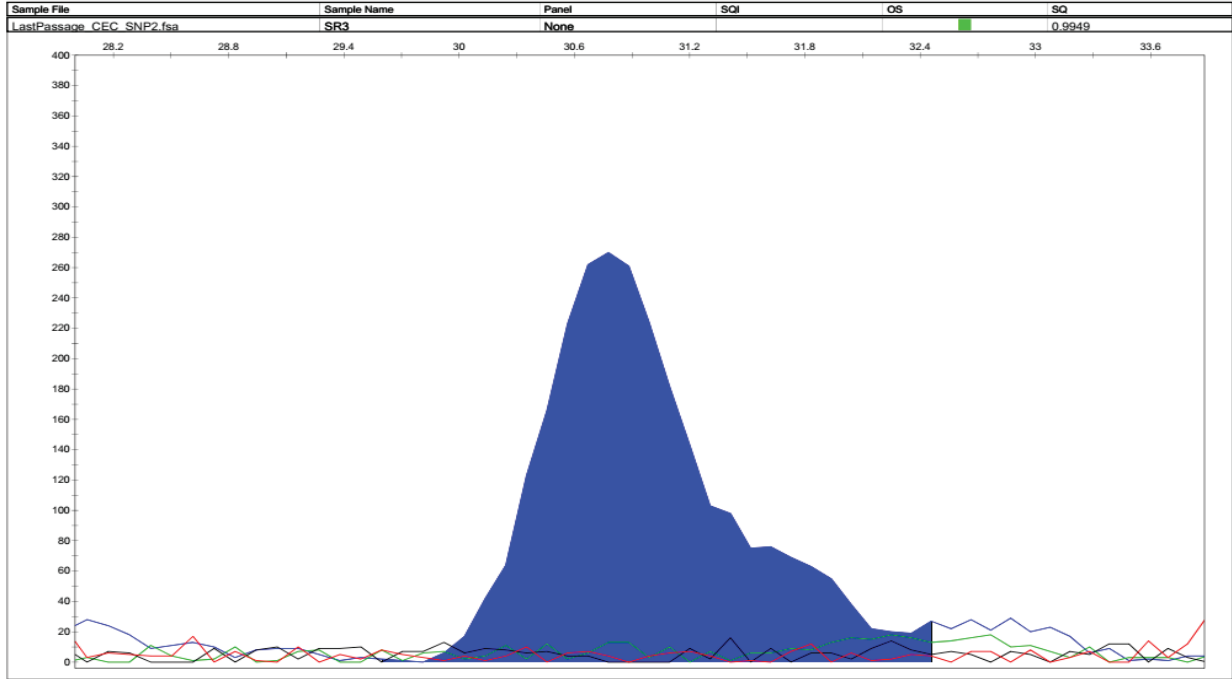
Fig. 1(c) Peak detected at SNP-3.
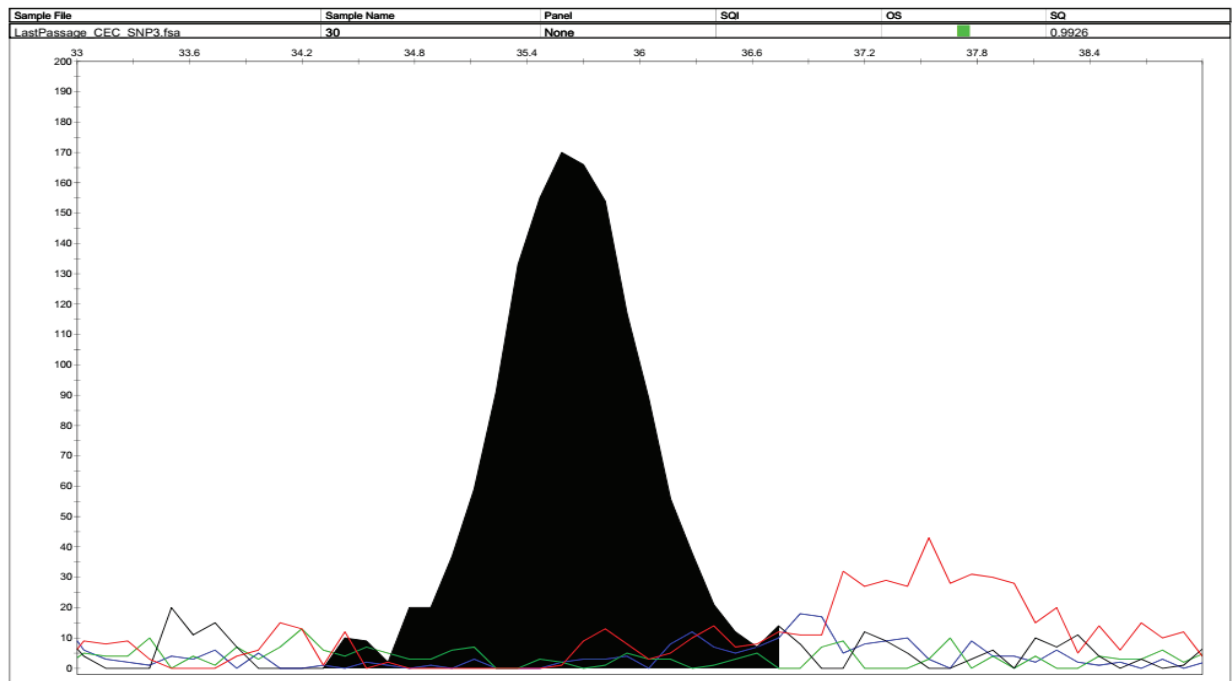
Fig. 2 depicts the results of validation of SBE assay.

Primer focus assay revealed that all the three SNP-specific primers could be resolved between 30 to 40 base pair size range and all the four fluorescent dyes were distinguishable as seen in Fig. 2(a).

Differences in the heights and sizes of the peaks are because of the differences in the molecular weights of the fluorochromes and their degree of affinities.

Sensitivity of the assay was evident from the fact that peaks were detected for HDC-mumps samples with as low as 2.1 log $CCID_{50}$ per 0.5 ml titer.

As is evident from the Fig. 2(b), the peak height and area of the original sample were found to be decreasing linearly over the three dilutions thus confirming linear response.

Three technical replicates of a sample containing primer duplex showed excellent reproducibility as is evident in the electropherograms in Fig. 2(c). Not only size, i.e. mobility but also the peak height, i.e. fluorescence intensity are seen matching in all the three replicates for all the peaks.

Fig.2. Results of Validation of SBE Assay

Fig. 2(a) Exemplary Primer Resolution with respect to Size and Fluorochromes

Fig. 2(b) Linearity response of the SBE assay
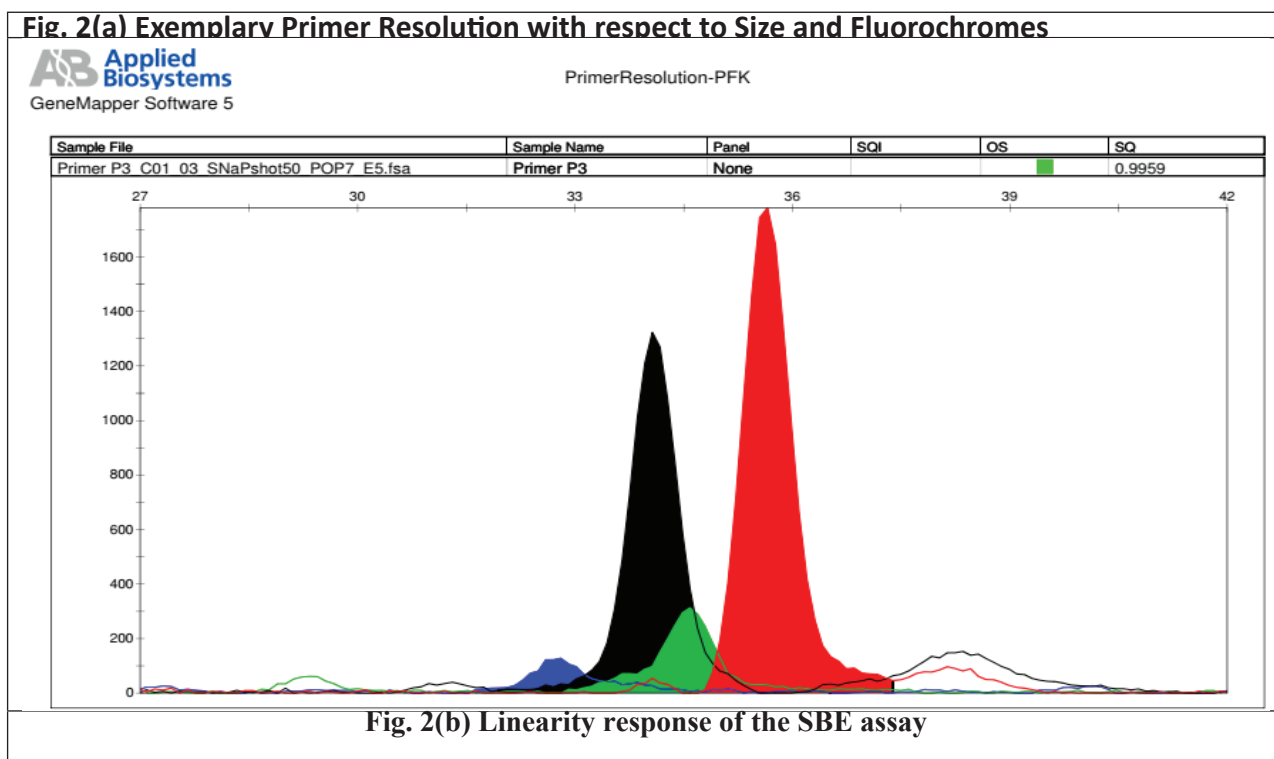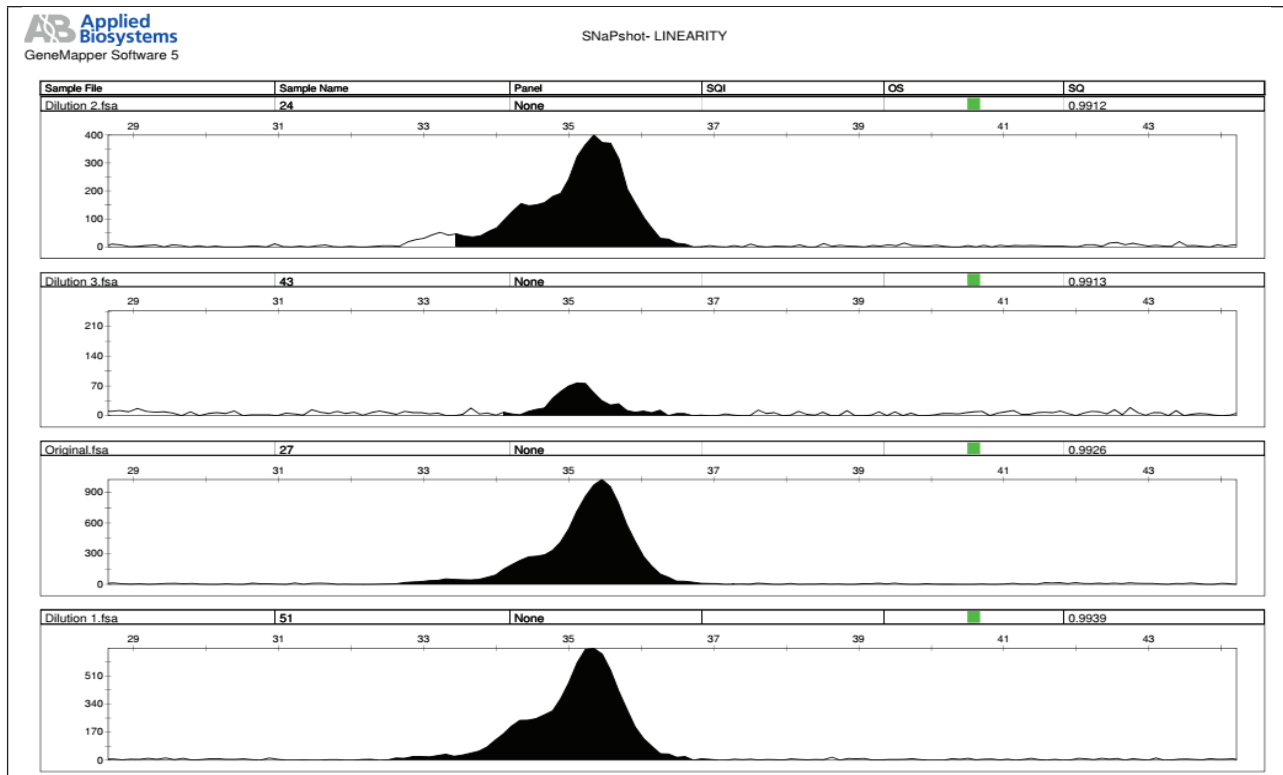
Fig. 2(c) Reproducibility response of the SBE assay
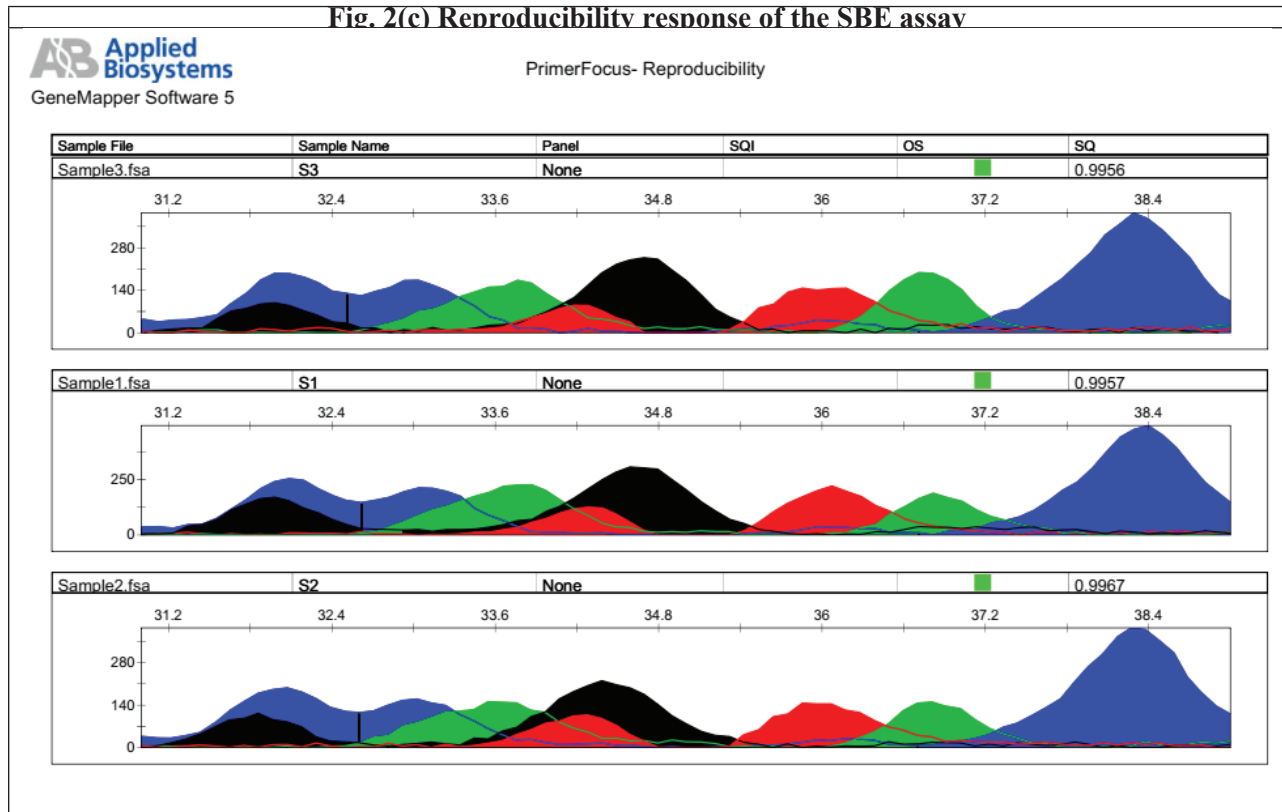
Discussion

As a part of a doctoral programme, studies on productivity improvements in L-Zagreb mumps

vaccine were undertaken. In this context, a mini-review describing evolution of viral vaccine production technology with respect to change in cell substrate and culture methodology has already been published.[8] So also a research article describing adaptation of L-Zagreb strain-based mumps vaccine on different cell substrates has been reported.[9] Further, the effect of changes in culture methods and cell substrates on key quality attributes of mumps vaccine have been evaluated.[10] In this research, the qualitative SBE method was found to be a useful tool for quick genetic analysis of experimental mumps vaccine virus samples.

Mumps vaccine, an RNA virus vaccine, is known for its changing in-vitro and in-vivo

properties.[11] It also exhibits quasispecies nature with defective interfering particles.[12]

Hence, it is very important to analyze and ensure the consistency in quality of the vaccine at every stage of the experiment, which can be achieved by the availability of a quick molecular method capable of judging the impact of changes.

Genetic consistency was observed at all the three SNPs, irrespective of changes in cell substrate and number of passages. Based on this evidence, it might be useful to undertake whole genome sequence analysis by advanced methods such as next generation sequencing.

The results of primer focus assay confirmed the suitability of the designed primers for the work. Red fluorescent dye was having maximum affinity and the blue dye showed minimum affinity with black and green dyes showing intermediate affinities. All the SBE assays were performed in singleplex configuration.

Multiplexing was deliberately avoided in first runs owing to a lot of optimizations necessary to achieve perfection. System variables such as pH, temperature, primer size, buffer type, its concentration, applied voltage and the type of polymer used can affect the electrophoretic mobility of the sample.

Sensitivity of the SBE assay was evident from the results obtained for the low virus titer, i.e. HDC grown mumps virus, for which the titers were around 2.0 log $CCID_{50}$ as against 5.0 to 6.0 log $CCID_{50}$ titers of Vero grown and CEC grown viruses.

The assay was found to be accurate based on the appropriate negative results obtained for all the negative controls. Negative controls in the form of 'No Template Control' and 'No Primer Control' were included in every SBE assay, besides 'No RT Control' in case of RT-PCR. Positive controls were available with the assay kits.

Given the high infidelity of RNA viruses, it could be possible that more and more mutations will become evident, especially under circumstances such as change in cell substrates. However, today not enough data is available for the biomarkers in mumps genome responsible for critical functionalities. When bioinformatics in this field gets enriched, SBE assays could become an indispensable tool, owing to its shorter lead time and relatively inexpensive nature.

This study has demonstrated that a simple, qualitative molecular method of identifying nucleotide bases at the known locations can be a useful preliminary tool for comparison of the genetic homogeneity of the virus populations adapted to grow on different cell substrates.

This study has reported for the first time, application of SBE for detection of bases at the known SNP hotspots of the L-Zagreb mumps virus grown on

HDC, CEC and Vero cells.

Conclusion

Overall the SBE method was found to be a practical first hand alternative to verify genetic homogeneity. Although, it could not be a substitute for the whole genome sequencing, it could be useful in initial characterization of biological samples as well as to quickly understand the impacts of critical changes done in the production process of biologics.

The multiplexing potential of this tool can save a lot of time and resources, especially when high throughput screening is essential for large number of samples.

This study was performed with singleplex configuration for each sample and for each of the three SNP sites, but in future, carefully optimized multiplexing assays can be developed, especially if more number of SNP locations are to be evaluated.

Conflict of Interest: Authors, who are employees of Serum Institute, declare that there is no competing / conflicting interest for the work carried out as described in the manuscript.

Source of Funding: There was no external funding received for this work.

Ethical Clearance: The study is exempt from ethics committee review because no animals or humans were involved in it.

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Oral and Perioral Piercings: Awareness and Knowledge among Undergraduate Dental Students in a Private Dental College, Haryana

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Abstract

Background: Oral and perioral piercings are now commonly seen in young adults leading to various types of complications. Undergraduate dental students are the most immediate group with peers belonging to this age criteria thus their knowledge regarding oral piercings and related complications is of utmost concern. **Aim**: The present study was conducted among undergraduate dental students in a private dental college in Haryana to determine the knowledge and awareness of oral and perioral procedures and their complications. **Materials and Methods**: A closed ended questionnaire was circulated online using Google forms. Total 145 dental undergraduate students of a private college participated in this survey. Total 10 questions were asked from the students .The data was then evaluated in form of pie charts and bar charts. **Result**: The subjects had a fair knowledge and awareness about oral and perioral piercing procedures and their associated complications.**Conclusion:** These undergraduate students had a decent awareness and knowledge about the oral and perioral piercings. But as oral and perioral piercings have potential oral health hazard, we wish to recommend that it should be not encouraged and request the dental fraternity to discourage the same.

Keywords: Oral piercing, perioral piercing, complications

Introduction

Piercing is a worldwide form of body art has become increasingly popular inwestern society[1]Piercing refers to the infiltration of the jewelry into the body areas such as the eyebrows, ears, tongue, nose, lips, navel and genitals.[1,2]Oral and perioral piercing has been practiced for a long time for various religious, cultural, sexual or identical reasons and has been believed and practiced autonomously all over the world.[2] With today's fast-growing generation, a desire for distinctive identity is the main factor responsible for such piercings.[1,2]Lately oral piercings has gained popularity among teens and young adults. Self-representation in these age groups has increased significantly and they go towards extreme to get desired results. [3] Other contributing factors are daring behavior, independence of spirit and enhancing the body as per the "fashion".[3, 4]Although tongue piercing is the most common, followed by lips, piercing has entered a new sphere involving other areas such as

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frenum, uvula, philtrum, cheeks and even tongue splitting. [1-5]Frequently used jewelry for such piercings are barbell, studs, labret, captive beads, rings etc. [1-5]

Even though individuals succeed in expressing themselves, but many of them are unaware of the associated risks. It is important to know that oral and perioral piercings not only affect oral health, but also cause other long-term systemic damage if not treated with care[6] .Many local and systemic complications have been observed as a consequence of oral and perioral piercing which include;

Immediate complication

Edema of the tongue leading to airway obstruction, [7, 8, 9] pain of tongue affects speech, mastication and deglutition. [7, 9, 10] Anaphylactic reactionscan be caused by some of the materials e.g., nickel, hyper salivation, [7, 9] hemorrhage,puncturing the tissues without proper measures can cause severe hemorrhage, trigeminal nerve damage,inferior alveolar and superior alveolar are commonly involved, lingual nerve damageusually seen in tongue piercings, aspiration of jewelryduring an uvula piercing or tongue piercing, leading to chocking and death of the patient. [7, 11]

Delayed complication

Ulcerations, [11, 12] plaque accumulation can produce halitosis and possible infections [11].Endocarditis being the most commonand potentially due to Neisseria mucosaand Haemophilusaphrophilus [13,14,15]. Localized infectionmoist warm environment enables the breeding ground for bacteria. [1, 3, 11]Trauma to lingual gingiva, erythema and edema of gingiva by rubbing the ball in the lingual gingiva. Fever, chills, shaking or red streak appearance near the site of piercing. Periodontal attachment loss involving proximal teeth,[16,17] [18] Ludwig's angina usually due to frenulum and lingual piercing, [1,9,19] hyperplastic tissue,[20,21,22] dehiscence especially in mandibular anterior,[21] fractured teeth occur by biting the barbell,

careless jewelry insertion, talking, eating etc.[1,9,24,25,26] Gingival recession due to continuous friction of the gingiva with the jewelry. [3,16,17,23,24,28,29,31] If tongue piercing goes wrong, patient experiences bifid tonguewhich can only be treated surgically. [27] Pulpal sensitivity from contact between galvanic currentsin stainless steel ornaments and other intra-oral jewelry. [9, 19]Radiopacity of piercing jewelry is seen during X-ray examinations. Hence for panoramic X-.rays, removing metal objects above the neck is a must. [11] Most dangerous oral site for piercing is the uvula, due to the increased chances of airway obstruction. It has been found that piercing is a potential route for the transmission of viruses such HIV, [30] hepatitis (B, C, D and G), herpes simplex and Epstein-Barr. [4, 10] Lick et al. have discussed few aiding factors to infective endocarditis. [13] They have mentioned congenital deformities and the possibility of cerebral brain abscesses. [31]As dental students, it is the responsibility of each and every student to educate their peer groups as well as patients about the effect of piercing and how it acts as a double edge sword.

Materials and Method

This was a questionnaire based survey on the awareness of complications, related to oral and perioral piercing which was conducted online using Google forms. In total 145 undergraduate students of a private dental college participated in this survey. Total 10 questions were asked from the students .The participants replied to the survey by clicking appropriate option. The questionnaire was self-conceptualized and its authenticity was made by discussing it with professors of Oral Medicine and Radiology. The survey was approved by institutional ethical committee of the college. After the data collection, statistical analysis was done.

Inclusion criteria-

- 19-22 years of individuals

- Region- Haryana

- Students from private dental college

Exclusion criteria

- Faculty, PG students and Interns

- Students not belonging to private dental college, Haryana

Results

Total of 145 subjects participated in the study and the results were evaluated with pie charts and bar charts.

1. **Have you ever heard of or seen oral and perioral piercing?**

88.2% have heard or seen oral and perioral piercing, 9% have never seen or heard of oral and perioral piercing and 2.8% responded with maybe.

2.If yes then from where?

83.6% said they saw it in movies 38.1% saw it in articles 37.3% heard it from friends and 4.5% from family members.

3. **What is the most common site?**

51.4% responded with most common site as tongue 30.3% said lower lip 9.9% said upper lip 8.5% responded as philtrum.

4. **Click on the options you think are the piercing sites.**

As far as the knowledge of other piercing sites are concerned only 6.4% knew that uvula is also pierced 19.3% knew about cheek 22.9% knew about frennum 88.6%about lips and 87.1% about tongue.

5. **Do you think there is any complications after oral and perioral piercing is done?**

While enquiring about the complication, 71.6%

responded as yes that there exist complications related oral and perioral piercing 25.5% responded as maybe and 2.8% didn't know about the complications.

6. **What according to you are the complications of oral and perioral piercing**?

88.9% knew ulceration as a complication 62.2% knew about edema and hemorrhage. 35.6% knew about gingival recession 30.4% had knowledge about hepatitis 22.2% knew about endocarditis and only 18.5% knew about Ludwig's angina.

7. **What according to you are the jewelry used for oral piercing?**

78.1% were familiar with ring as an oral piercing jewelry 64.2% recognized stud as an oral piercing jewelry 13.9% identified barbell as jewelry and only 5% knew about labret.

8. **Why do you think people get their oral and perioral piercing s done?**

71.3% considered oral piercing as a fashion statement 21% believed it as a self-expression 1.4% regarded it as superiority and 6.3% didn't know why people perform oral piercing.

9. **Do you think once oral piercing is done, there will be any change in oral hygiene methods?**

72% believed that that will be change in oral hygiene practice 25.2% responded with maybe and only 2.8% said there will be no change.

10. What do you think is the most common age group that goes for oral piercings?

74.1% presume that teenagers are most commonly involved with oral piercings 21.7% responded that adults do it 2.8% answered as children and 1.4% old age.

Discussion

Oral and perioral piercing is just an ill wind that blows nobody any good. These piercings are performed in tattoo studios. Many of the piercers are not even licensed practitioners and thus piercing procedures are done without even giving appropriate anesthesia. [7] Some of them use the same needles to different person frequently without sterilization. Hence, various piercing failure cases have been reported worldwide. In fact, American Dental Association has put across an opposing statement against oral piercings. [32]

"The American Academy of Pediatric Dentistry strongly opposes the practice of piercing intraoral and perioral tissues and use of jewelry on intraoral and perioral tissues due to the potential for pathological conditions and sequelae associated with these practices"

Cinzia et al., clearly explains how the oral hygiene practices changes after oral piercings.[4]but in our study only 72% students knew about this fact and rest were unaware of the context. According to Hennequin-Hoenderdos et al., the rising popularity of body piercings in young adults, is determined by various factors, including the urge to fulfil social demands, establish a personal statement or enhance sexual appeal. [33] but in our study, 71.3% students considered oral piercing as a fashion statement. Moreover only 5.8% students in our study knew that labrets are also used as an ornament.

Conclusion

Dentists are the paramount professionals in detecting such complications and hence they should be well aware and so requires comprehensive knowledge regarding sequelae of oral and perioral piercings. Dental students on the other hand are nascent dentists and thus play an important role in educating their peer groups and other patients. Although many dental students had a knowledge regarding harmful complications of oral and perioral piercing, but many pages are unturned with respect to its severity and how it affects the life of an individual after. Hence, students should encourage everyone to be aware of these ruinous procedures and discuss their detrimental effects with patients as much as they can. Students should also educate them about how the oral hygiene practices change after these jewelry, and how to properly maintain the oral hygiene.[33]

Conflict of Interest – NIL

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Study on the Effect of Socioeconomic Status of the Family on the Primary Dentition of Neonates in the Ganjam District, Odisha

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Abstract

Background: The age at, type and number of the teeth eruption of primary dentition has been linked to a variety of environmental variables. The studies on possible socioeconomic factor as a variable for the primary dentition of neonates is still limited in the literature. The purpose of the study was to determine the primary dentition of neonates in Ganjam district, Odisha, India, in relation to socioeconomic level of their families.

Method: From the moment a child was born until he or she became two-year-old, primary dentition information such as time, type, and patterns were documented. Also, before to conception, information on the mother's socioeconomic factors were gathered and statistical analysis were carried out.

Conclusion: The findings support the previous evidence of environmental influences on the time of primary dentition eruption by demonstrating that maternal socioeconomic status has a significant impact on primary dentition. For the research region, the socioeconomic status of the family has the least impact on the number of teeth at first eruption.

Keywords: *Socioeconomic, Dentition, Neonates, Mother, Number of teeth, Type of first erupted teeth*

Introduction

The human dentition is diphodont types of dentitions. It is composed of primary and permanent sets of teeth. The primary dentition is composed of 20 teeth having 10 teeth in each arch while the permanent teeth are 32 in numbers with 16 in each arch. The commencement of human primary dentition occurs at the age of fifth week of the developing fetus[1]. The usual eruption of primary teeth in the neonates occurs at the age of 6 month to 12 months. The development of primary teeth begins between 4 and 6 months during the gestation in utero as hard dental tissue. At the time of birth all the primary teeth are present diminutive inside the jaw. The primary dentition and time of emergence of first incisor teeth is associated with candidate gene [2]. Along with the genetic factors some other processes during the embryonic development have long impact on the health of newborn. It has been established that the preconception, pregnancy, and post-natal factors influence the health and different aspects of primary dentition by acting up on throughout pregnancy and infancy[3], [4].

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When nutrition as a factor is taken into the consideration it has been found that oral health of the child integrally connected with the nutrition right from the moment of conception. Even it is evidently seen that dietary practices during pregnancy determines the infants and child's oral health status. Care given practices of the mother including infant feeding, oral hygiene and introduction of food further modulate the oral health of the neonates [5]. Different studies have postulated the influence of environmental factors such as weight and length of the neonates, malnutrition, and maternal smoking on the eruption of primary dentition [6], [7], [8], [9]. It has also been ascertained about the correlation of eruption pattern of primary dentition with different ethnic origin of neonates [10]. Different studies have established the significant influence of socioeconomic status of the family on child's development including its prenatal and postnatal aspects of development [11]. Children and even the adolescents hailed from low socioeconomic status group are more liable to oral health related issues including dental caries [12], [13], [14]. In this connection the present study has aimed to evaluate the impact of socioeconomic status of the family on the primary dentition of the neonates with respect to the age at time of first eruption, number of teeth that first erupted.

Materials and Methods

Study Population

The study was carried out in different parts of the Ganjam district Odisha by randomly selecting the volunteers' mothers. Ganjam district is one of the populated and advanced district of Odisha having heterogeneous socioeconomic classes of people. The demography of Ganjam district indicates the heterogeneity in terms of the socioeconomic status (SES) of the families. Families of different SES were randomly sampled from rural, sub urban and urban areas of district. Data on different study parameters were collected from the sampled families, health workers, community health centers, Anganwadi workers and office of the Chief District Medical Officer (CDMO). To obtain data on various aspects of post-natal development of baby, the volunteer families were visited or contacted over phone call in regular interval.

Collection of Maternal socioeconomic status data

Data was gathered during pregnancy as well as afterwards during scheduled house visits, Anganwadi visits, and phone calls. Prior to the collection of the data regarding the primary dentition of the neonates the the data of pregnant women of age group 20 to 34 was collected between the year 2018 and 2020 by consulting with the Anganawadi workers from different rural sub urban and urban areas of the district. This study enrolled a total of 312 pregnant women, who were followed up further. The expectant mothers were asked questions about their age, education, occupation, and other socioeconomic factors during the data collection process. The mothers were categorized in to 5 SES groups using the data collected from the questionnaire.A house-visit or a phone-call made in an interval of 6 months to all the mothers were done after the birth of the baby.

Collection of the primary dentition data of the neonates

For dentition study, out of 312, total 300 mothers and their babies (158 boy and 142 girl) were considered. The remaining participants were removed from the study as they became inaccessible over the long-term data collection process. The age of the babies at the time of their first tooth eruption was gathered along with their gender. The type of the erupted tooth of the neonates was physically examined with the permission and help of the child's mother.

Conversion of data to Statistical Parameters

All the participants were given an information consent sheet detailing the study's needs and their rights, before requesting them to submit their information. In the initial screening, the information such as age, stage of pregnancy, expected delivery date, education, occupation, and monthly income are collected. Subsequently post-birth information was collected including the gender, date of birth, birth weight, and health status. Later their dentition details such as date of first teeth eruption and number of teeth were collected within the suitable time frames.

Assessment of the Socioeconomic Status (SES) of the Mother

The collected parameters such as education, occupation and family income is collectively used for calculating the SES of women. The SES is further divided into five categories with reference to the Kuppuswamy scale[15]. This scale consists of a composite score that combines the education and occupation, as well as the family's monthly income, yielding a score of 3to29. As illustrated in Table-1 and Table-2, this scale divides the research populations into five SES groups.

Table 1. Modified Kuppuswamy scale [15]

Education of head of the family	Score	Occupation of head of the family	Score	Total family income per month	Score
Professional degree	7	Professional	10	52,734 and above	12
Graduate or postgraduate	6	Semi professional	6	26,355-52,733	10
Intermediate/diploma	5	Clerical/shop/farm	5	19,759-26,354	6
High school	4	Skilled worker	4	13,161-19,758	4
Middle school	3	Semi-skilled worker	3	7,887-13,160	3
Primary school	2	Un-skilled worker	2	2,641-7,886	2
Illiterate	1	Unemployed	1	Less than 2,640	1

Table 2. Socioeconomic status and class definition with total scores

SES	Class	Total Score
1	Upper	26-29
2	Upper middle	16-25
3	Lower middle	11-15
4	Upper lower	5-10
5	Lower	3-9

Statistical Parameters and Analysis

MATLAB software was used to check the data for missing values and univariate and multivariate normality. Out of 312 samples, 12 samples are excluded and total 300 samples are considered to conduct the experiments. The collected data consists of 48% rural and 52% urban samples (Figure-1(a)). Which are divided into 5 SES classes (labeled as 1,2,3,4 and 5.) and their percentage of distribution is shown in the Figure 1-(b). The pie chart of total number of first teeth (labeled as 1,2 and 3) eruption is presented in the Figure 1 (c), and the distribution of the type of tooth erupted is shown in the Figure 1-(d). The type of teeth identified are 1) 1st left molar, 2) central incisor and 3) both 1st left molar and central incisor; which are labeled in the Figure 1-(d) as 1)

1st left molar, 2) Central incisor, and 3) CI & 1LM respectively.

The histogram of first teeth eruption over age (of baby) in months is shown in the Figure-2. This clearly depicts that, most of the babies have their first teeth eruption by 10th month.

Also, the frequency (heat-map) of number of first teeth eruption over age of baby (in months) is presented in the Figure-3. From this figure most of the babies have a pair of first teeth and maximally they erupt at 10th month. The Figure-4 shows the frequency (heat-map) of age (in months) at the time of first tooth eruption over various SES of the family. The Figure-5 shows the frequency (heat-map) of number of first teeth erupted over various SES of the family.
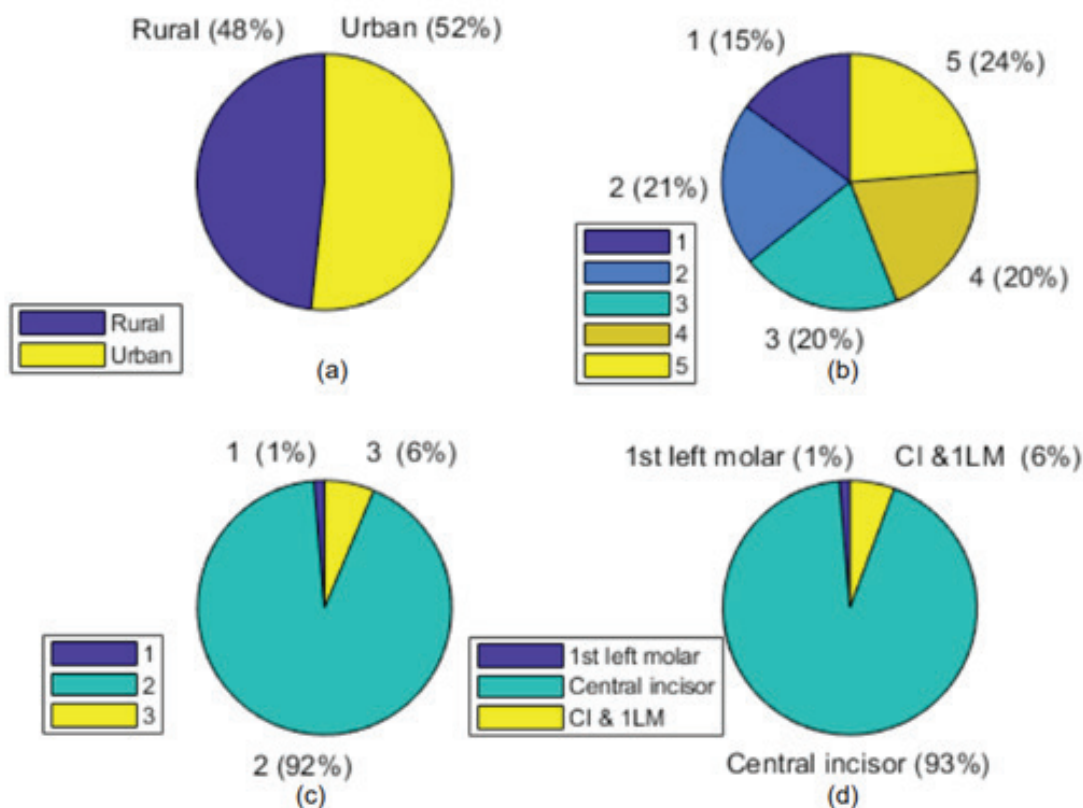
Figure 1.Pie chart of (a) Rural and urban samples, (b) categories of SES, (c) number of first teeth eruption and (d) Type of first teeth erupted
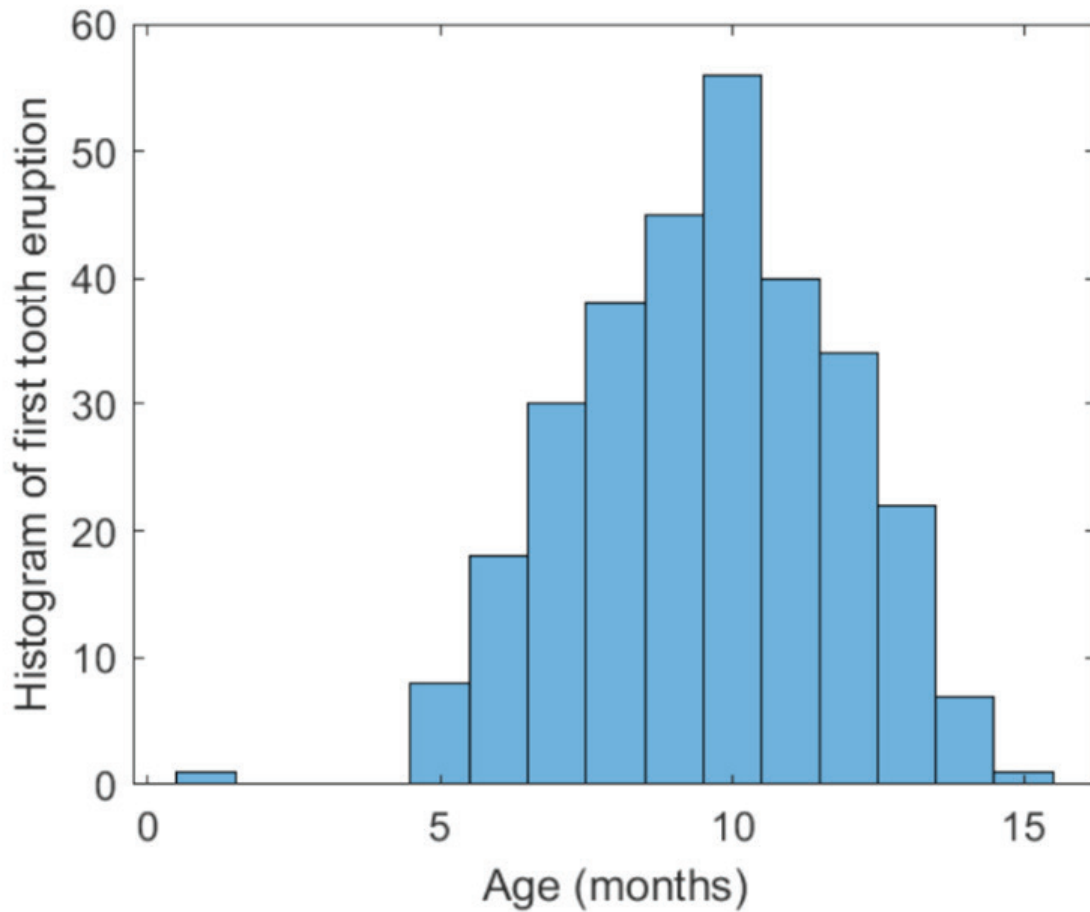
Figure 2.Histogram of first teeth eruption over age (of baby) in months
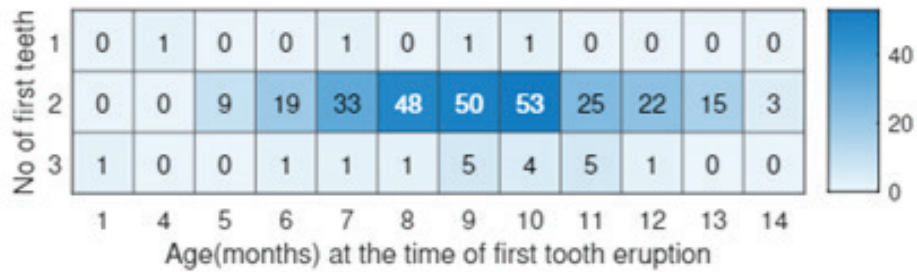
Figure 3.Frequency (heat-map) of number of first teeth eruption over age of baby in months
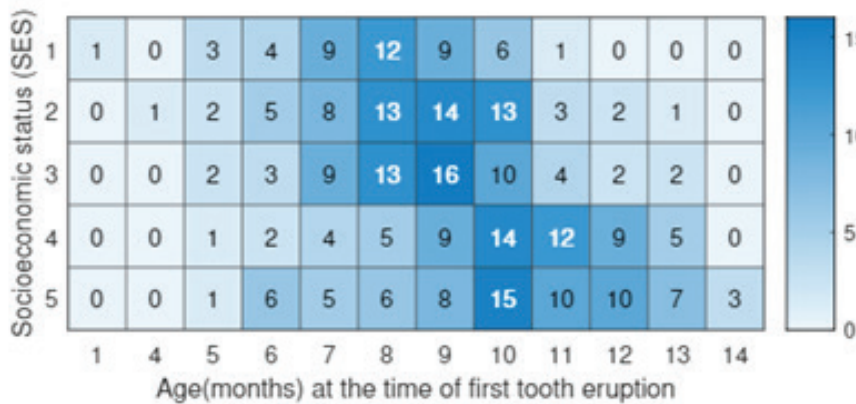
Figure 4.Frequency (heat-map) of age (in months) at the time of first tooth eruption over various SES
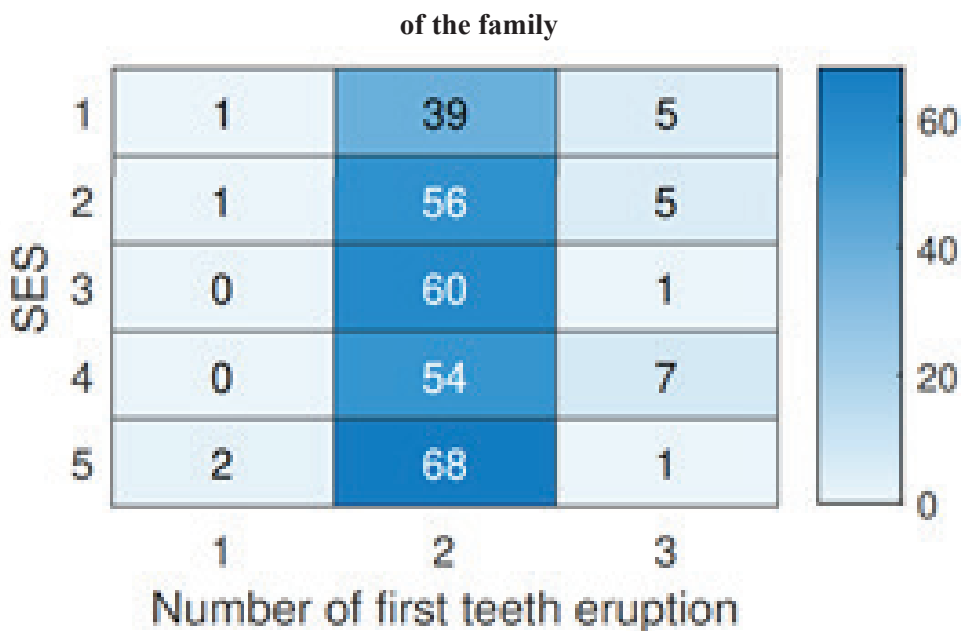
of the family

Figure 5.Frequency (heat-map) of number of first teeth eruption over various SES of the family

Results

Effect of maternal SES on the age of the child at time of first teeth eruption

The Table-3 provides the details of the number of cases in which the child's first tooth erupted on or before 10th month age. The Odd's Ratio (OR) calculated in 95% confidence interval (CI) to evaluate the association between the maternal SES and the age of child at first teeth eruption. The upper, upper middle and lower middle maternal SES shows a positive association between the factors, whereas the upper lower and lower maternal SES shows a negative association among the factors. Again, the OD is recalculated by dividing the maternal SES in two broad categories i.e. upper + middle and lower.

The OD found to be 7.663 in the CI of (4.071-14.422) for upper + middle maternal SES which is a positive association. Whereas, for lower maternal SES it is found to be 0.631 in the CI of (0.5412-0.735), a negative association. The data was further analyzed whether the factors like the gender of the child and demography of the mother's has any significant association on the age of the child for its first teeth eruption. It is found that neither the gender nor the demographic area of mother's has no impact on the age at which the first teeth of the child erupt. Hence, it could be concluded that the maternal SES has a significant impact on the dentition of the child in terms of age at which the first teeth of the child erupts irrespective of the child's gender and the demographic area of mother's.

Table 3. The effect on the age of the child for tooth eruption in relation to the maternal SES and other factors - univariate analysis

Variable	Total (300)	Tooth erupted before 10 months		OR and 95% CI for OR	Association
		Yes n1=229	No n2=71		
SES					
Upper	45	44	1	1.341 (1.230,1.463)	Positive
Upper middle	62	56	6	3.447 (1.417,8.382)	Positive
Lower middle	61	53	8	2.331 (1.059,5.173)	Positive
Upper lower	61	35	26	0.30 (0.168,0.561)	Negative
Lower	71	41	30	0.293 (0.164,0.523)	Negative
Broad SES category					
Upper and middle	168	153	15	7.663 (4.071,14.422)	Positive
Lower	132	76	56	0.631 (0.5412,0.735)	Negative
Gender					
Boy	161	126	35	1.222 (0.718,2.087)	No Significance
Girl	139	103	36	0.776 (0.455,1.322)	No Significance
Demography					
Rural	144	105	39	0.678 (0.397,1.157)	No Significance
Urban	156	124	32	1.399 (0.820,2.386)	No Significance

Association between maternal SES and number of first teeth erupted

The Table-4 details the cases of where the number of first teeth erupted is two or more and the cases where it is less than two. With the OR analysis with 95% CI, the result obtained shows no significant association between the maternal SES and the number of first tooth erupted for a child. The analysis is also performed from the gender of the child and demographic area

of mother's, and the obtained OR gives no significant association with the number of teeth first erupted. Hence, it could be concluded that the number of first teeth erupted are independent of the maternal SES, gender of the child and demographic area of mother's.

Table 4. The effect on the number of first teeth eruption of the child in relation to the maternal SES and other factors - univariate analysis

Variable	Total (300)	Two teeth at first eruption		OR and 95% CI for OR	Association
		Yes n1=277	No n2=23		
SES					
Upper	45	39	6	0.464 (0.172,1.250)	No Significance
Upper middle	62	56	6	0.717 (0.270,1.904)	No Significance
Lower middle	61	60	1	6.082 (0.803,46.052)	No Significance
Upper lower	61	54	7	0.553 (0.216,1.412)	No Significance
Lower	71	68	3	2.169 (0.625,7.525)	No Significance
Broad SES category					
Upper and middle	168	155	13	0.977 (0.414,2.304)	No Significance
Lower	132	122	10	1.023 (0.433,2.412)	No Significance
Gender					
Boy	161	150	11	1.288 (0.549,3.019)	No Significance
Girl	139	127	12	0.776 (0.331,1.818)	No Significance
Demography					
Rural	144	130	14	0.568 (0.238,1.357)	No Significance
Urban	156	147	9	1.759 (0.736,4.198)	No Significance

Discussion

Oral health effects the quality of life among children. This is because it influences how a child tastes the food by chewing and there by grows and enjoys life [16]. The quality of primary dentition among the neonates begins from the conception, evidently perceiving the influence of the mother's nutritional and other socioeconomic status on the oral health of the neonates [17].

Our study and its results strongly affirm the effects of SES on the age of first eruption of the neonatal tooth. The neonates born to the higher SES family have earlier first tooth eruption relatively to the neonates born to the family of the lower SES group. The SES has an impact on the knowledge and attitude of the parents and there by determining the quality of pre-natal and post-natal care [18]. Being privileged with respect to finance and knowledge, the mothers of higher SES are more conscious of their dietary requirements during and after pregnancy. Hence, their fatal development meets all the essential nutritional requirements, whereas the under privileged section of SES are less independent of finance and knowledge about neonatal care. It has also been marked that some neonates from higher SES group are also subjected to late eruption of the primary teeth. These unusual events can be attributed to the non-parental care given to the neonates. While if both parents are employed, they hardly find time to spare with their newborn and personally look at their general health [19]. Study shows a negative impact on the different aspects of primary dentition such as delayed dentition, lesser number of primary teeth etc. [20]. In our study area, the low SES group families are loaded with over crowed family members. Overcrowding effects the oral health of the neonates, as the parents show a negligent attitude towards the primary dentition which is being considered as a mate of lesser importance.

It would thus be reasonable to say that the family environment of different SES groups is an influential factor towards the primary dentition of the newborn [12]. In our study, this is a positive aspect of different SES groups. The number of first erupted teethare common in all SES groups. The underlined cause may be attributed to the access of quality food to the low SES group mothers by different social welfare schemes presently run-in different villages of the Ganjam district. It is even observed that timely health care facility, nutrition support and health guidance by the experts are being provided free of cost to the underprivileged mothers in most parts of the district of Ganjam. This may be a reason behind the no discrimination was found in those aspects of primary dentition.

Conclusion

While reviewing the literature on the impact of SES on primary dentition, no such work from Odisha has come to our notice. So, it is imperatively said that primary dentition in the neonates is given less importance by the health care system of the current study area and people are less aware of this. On the backdrop and light of the current research work, the author likes to suggest all the stake holds of the mother and child health care providers to consider primary dentition in the neonates as one of the important aspects of early childhood development. The family members, especially the mother, should be made educated towards pre-natal and post-natal nutritional care with respect to the primary dentition of their neonates.

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Assessment of Nutritional Status of Anganwadi Children in Coastal Karnataka: A CrossSectional Study

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Abstract

Backrground: In India half of the under-5 mortality is attributed to undernutrition. As a consequence of malnutrition numerous health issues are seen in under-5 children. EEarly intervention during this period can reduce the morbidity and mortality. This Study aims to estimate the prevalence of Stunting, underweight, wasting and Thinness among anganwadi children in Dakshina Kannada district, Karnataka.

Methodology: A cross-sectional study was conducted among 564 anganwadi children in Dakshina Kannada district, Karnataka. Data collection was carried out using a pre-tested questionnaire. Anthropometric parameters for the assessment of nutritional status of children were measured using standard guidelines.

Results: Boys weighed slightly more than girls in the age groups 3 & 4 years whereas girls' weight was more for age groups 5-7 years. Except for the age group of 6 years, boys were found to be taller than girls. The prevalence of Stunning, Under-weight, Wasting and Thinness in our study was found to be 25.9%, 22%, 27.8% and 24.1% respectively. The prevalence of all 4 parameters were higher among age group of 5 &6 year old children.

Conclusion: Stunning, Under-weight, Wasting and Thinness are theissues which requires our country to ensure implementation of policies which are practical and effective and also the interventions across the life cycle that take into account the variations and the context of each state in our country

Key Words: *Anganwadi, Stunting, wasting, underweight, thinness*

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Introduction

Global Nutrition Report 2018 shows that around 46.6 million stunted children live in India which is roughly one third of world's stunted children.[1]Undernutrition is responsible for around half of all under-5 child mortality in India.India being

one of the developing nations, nearly half of the children under 5 years succumb to death every year dueto under nutrition.

There are numerous health issues which could occur as consequences of malnutrition. They are increases in future adult disability, childhood death and diet-related non-communicable diseases (NCDs), as well as huge economic and human capital costs.[2]The list of morbidity among school-aged children due to under-nutrition includes poor cognitive development, lower school performance,reduced body size, reduced muscular strength,and depleted work capacity.[3-7]

The problem with the under-nutrition is does not stop just with increased morbidity and mortality, it also has unfavourable consequences with economy too.It is estimated that malnutrition with whole spectrum of manifestations could cost the society up to US$3.5 trillion per year[8]

Global estimate showsthat the number of children suffering from stunting is approximately 149 million. The estimates for wasting and severe wasting in under-5 years of age in 2018 are 49 million and 17 million respectively. The number of malnourished children is projected to increase by 25 million more by 2050.[9]The prevalence of stunting, wasting and overweight at national level as 37.9, 20.8 and 2.4%respectively as reported in the Global Nutrition Report 2018.[1]

The latest National Family Health Survey (NFHS)-5 report shows the prevalence of Stunning, Under-weight and Wasting in India to be 22.5%, 23.7% and 16% respectively.[10] As per NFHS IV (2014–2015)[11], 38.4, 21 and 35.7% of children below 5 years suffer from stunting, wastingand underweight respectively (corresponding figure for NFHS III, 2005–2006[12] were47.9, 19.8 and 42.5% respectively). Prevalence of severe acute malnutrition (SAM)in India is 7.5%[11].

Though the early-life malnutrition has numerous impact on health, there is some evidence that it could be partially reversible[13-15]which reinforces the view that interventions to address child nutrition could reverse, or at leastalleviate, some of the consequences of early-life nutritional deficiencies on cognitive development.[16]With this motivation, this paper aims to estimate the prevalence of Stunting, underweight, wasting and Thinness among anganwadi children in Dakshina Kannada district, Karnataka.

Materials and Methods

This research project is a cross-sectional study done among Anganwadi's in Dakshina Kannada district, Karnataka. The department of Community Medicine, Srinivas Institute of Medical Sciences, Surathkal, Mangalore regularly conducts anganwadihealth surveythrough Under-graduate and Post-graduate students, Interns and medico-social workers. 564 anganwadi children were enrolled by convenientsampling method for the purpose of this study.

Ethical clearance was obtained from institutional ethics committee. *Informed consent from Child Development Project Officer* (ICDS-*CDPO), Anganwadi teachers and parents of each child was obtained.*Data collection *was carried out using a pre-tested questionnaire*. The age (in completed years) ofthe children was obtained from the anganwadi records.

Anthropometric parameters for the assessment of nutritional status of children were measured using as follows:

Weight:After doing standardization ofthe apparatus and method, floor type weighing scale was used to measure the weight. The measurements weretaken to the nearest 0.5Kg.

Height:Was taken using a measuring tapeapplied to the wall. The measurements were takenwith children barefoot with their back of heels,buttocks and head touching the wall. Readings weretaken to the nearest 0.5cm.WHO Z- score system was used to classify thenutritional status of the children. SPSS software version 16 was used to analyse the data.

Results

It was found that in the age group of 2 years there were no males and 6 females with mean +/- SD weight (kgs) of 12.8 (2.3) and height (cm) of 93.6 (1.3). In the age group of 3 years there were 78 males and 94 females. The mean +/- SD weight (kgs) and height (cms) for males was 13.2 (1.3) and 94.7 (5.8) respectively, whereas for females it was 13.1 (1.7) and 94.6 (6.5) respectively.In the age group of 4 years there were 90 males and 126 females. The mean +/- SD weight (kgs) and height (cms) for males was 13.9 (1.7) and 100.5 (5.3) respectively, whereas for females it was 13.8 (1.3) and 98.3 (5.2) respectively. In the age group of 5 years there were 62 males and 78 females. The mean +/- SD weight (kgs) and height (cms) for males was 14.4 (1.5) and 101.3 (6.4) respectively, whereas for females it was 14.5 (1.6) and 100.7 (5.6) respectively. In the age group of 6 years there were 20 males and 6 females. The mean +/- SD weight (kgs) and height (cms) for males was 14.8 (1.9) and 102.8 (8.3) respectively, whereas for females it was 16.0 (0.7) and 111.0 (7.1) respectively. In the age group of 7 years there were 4 males and no females. The mean +/- SD weight (kgs) and height (cms) for males was 12.2 (0.3) and 102.0 (6.9) respectively.

Table 1. Depicts Gender distribution of Stunting (Height-for-age)

STUNTING	Yes	No	Total	P value
Male	69 (12.2)	185 (32.8)	254 (45.0)	
Female	77 (13.7)	233 (41.3)	310 (55.0)	0.53
Total	146 (25.9)	418 (74.1)	564 (100)	

Table 2. Depicts Gender distribution of Under-weight (Weight-for-age)

UNDER-WEIGHT	Yes	No	Total	P value
Male	70 (12.4)	184 (32.6)	254 (45.0)	
Female	54 (9.6)	256 (45.4)	310 (55.0)	0.004
Total	124 (22.0)	440 (78.0)	564 (100)	

Table 3: Depicts Gender distribution of Wasting (Weight-for-Height)

WASTING	Yes	No	Total	P value
Male	89 (15.8)	165 (29.3)	254 (45.0)	
Female	68 (12.1)	242 (42.9)	310 (55.0)	0.001
Total	157 (27.8)	407 (72.2)	564 (100)	

Table 4: Depicts Gender distribution of Thinness (BMI-for-Age)

THINNESS	Yes	No	Total	P value
Male	74 (13.1)	180 (31.9)	254 (45.0)	
Female	62 (11.0)	248 (44.0)	310 (55.0)	0.012
Total	136 (24.1)	428 (75.9)	564 (100)	

Table 5: Depicts Age distribution of Stunting, Underweight, Wasting and Thinness:

Age (yr)	STUNTING			UNDER WEIGHT			WASTING			THINNESS		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
2	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2(33.3)	2 (33.3)
3	14 (17.9)	9 (9.6)	23 (13.4)	4 (5.1)	11 (11.7)	15 (8.7)	6 (7.7)	13 (13.8)	19 (11.0)	10 (12.8)	28(29.8)	38 (22.1)
4	12(13.3)	38(30.2)	50(23.1)	19(21.1)	17 (13.5)	36 (16.7)	38 (42.2)	27 (21.4)	65 (30.1)	34 (37.8)	22(17.5)	56 (25.9)
5	24(38.7)	30(38.5)	54(38.6)	27(43.5)	26 (33.3)	53 (37.9)	31 (50.0)	28 (35.9)	59 (42.1)	20 (32.3)	8(10.3)	28(20.0)
6	15 (75)	0 (0)	15(57.7)	16(80.0)	0 (0)	16 (61.5)	12 (60.0)	0 (0)	12 (46.2)	8 (40.0)	2(33.3)	10(38.5)
7	4 (100)	0 (0)	4 (100)	4 (100)	0 (0)	4 (100)	2 (50.0)	0 (0)	2 (50.0)	2 (50.0)	0(0)	2(50.0)
Total	69	77	146	70	54	124	89	68	157	74	62	136

Discussion

In-spite of improvements in India in terms of introduction of new schemes, Indian children continue to suffer from undernutrition and infections, which have long standing adverse impact for human development in terms of health and socioeconomic status.[17,18]Under-weight, stunting, and wastingreflect the adversity andare therefore considered as indicators for undernutrition and exposure to infections at the population-Level3.

The female children were more in number compared to male children in the study except for

minor increase in male participants in age 6 & 7 years.Boys weighed slightly more than girls in the age groups 3 & 4 years whereas girls' weight was more for age groups 5-7 years. Except for the age group of 6 years, boys were found to be taller than girls.

Tables 1-4 shows the gender distribution of Stunning, Under-weight, Wasting and Thinness. The prevalence of Stunning, Under-weight, Wasting and Thinness in our study was found to be 25.9%, 22%, 27.8% and 24.1% respectivelywhich are slightly higher than the latest National Family Health Survey -5[10]report except for the Under-weight. If we compare with the indicators from NFHS-4 reports[11], then all 3 parameters are higher in our study.

K Bose et all conducted a similar study among 454 children in Onda, Bankura District, prevalence of underweight was 16.9%, stunting was 17.2% and thinness was 23.1% which were lower than the estimates in our study.[19] In a study conducted by Patil S N et al in the rural school children of Ratnagiri district of Maharashtra the stunting (30.3 %) was found to be higher than our study parameter whereas underweight and thinness were found to be slightly lower 19 %and 16.8 %, respectively.[20]

In a study conducted by Bose et al among the children enrolled in Integrated Child Development Services (ICDS) scheme of Chapra, West Bengal[21]the prevalence of underweight, stunting and thinness were 31.0%, 23.9% and 9.4%, respectively.

Systematic review of 16,642 primary school-aged children from 30 articles[22] showed the pooled prevalence of stunting, wasting and underweight were found to be 21.3% (95% CI: 17.0, 25.5), 17.7% (95% CI, 13.5, 21.8) and 18.2% (95% CI: 14.4, 22.0) respectively which are lower than the estimates of our study. A similar study[21] showed the prevalence of Stunning, Under-weight and Thinness were all more prevalent among girls.

Table 5 reflects the age distribution of Stunting, Underweight, Wasting and Thinness. If we see the age wise distribution of the parameters, the prevalence of all 4 parameters are higher among age group of 5 & 6 year old children whereas in the study conducted by Patil S N et al, the prevalence of the parameters are almost same across the age groups.[20] The prevalence of Stunning and Under-weight were more prevalent among age groups 5 years whereas the Thinness was found to be more among 3 year old children.[21]

Conclusion

Even with regular introduction of new schemes, Indiacontinues to suffer from high prevalence of undernutrition,coupled with another set of nutrition problem of overweightand obesity which is steadily increasing in a subset of the population.These issues requires India to ensureimplementation of policies which are practical and effective and also the interventions across the life cycle that take into account the variations and the context of each state in our country.

During the COVID pandemic, we all understood the importance of mathematical modelling and projections, the under-nutrition problem also deserves such forecasting of the malnutrition indicators to plan the policy and interventions in advance.

One of the important recommendations from the study is longitudinal follow-up studies to be conducted in order to determine whether the issues of under nutrition persist or decrease over a period of time. The studies can concentrate further on determining the long-term impact of the nutrition schemes at the lower socio-economic schools.

In addition, special importance should be given for children belonging to school aged in the early stages of school years, in terms of designing programs for the mothers who lack formal education, and also interventions to preventand treat /deworming for

parasitic infections.

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Community Engagement as a Tool for Improving Efficiency of Primary Eye Care Delivery: Case Studies from Two Different Models

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Abstract

Background: Delivery of healthcare services needs to be rooted in frameworks supporting community engagement. Our organization delivers primary eyecare through two different models. These case studies quantitatively analyse the impact of community collaboration on the effectiveness of these models-camps and vision centres.

Methods: Camp data from two rural blocks of north India comparing first year of operations in 2016 with that of 2017; April-September 2017 data from two underperforming vision centreswas compared to data from same period in 2018.Natural interventions in camps included visits of local leaders to surgical centre, health talks spreading awareness regarding eyecare plusour organization, and local partners helping counsel patients, while for vision centres,staff was trained to conduct regular health talks and meetings in nearby villages. For camps, before and after data on attendance, proportion of people over 50, proportion of people getting operated among those advised and acquisition cost were analysed,for vision centres referral from these centres wereanalysed.

Results: Parameters for both models showed improvement inthe second year.

Conclusion: Sustained presence in the community and collaboration with local stakeholders increases effectiveness of service delivery at primary level.

Keywords: *Community Engagement; Outreach Camps; Patient Education; Patient Awareness; Primary Eyecare Delivery; Vision Centres*

Introduction

Notions regarding community engagement stem from the 1978 Declaration of Alma Ata, which laid the foundation for primary health care, and the need

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to root it within the community. More recently, the Framework on Integrated People-Centred Health Services[1]has been adopted, which emphasises community driven health care as the linchpin of health systems designed for people.In the Indian context, the National Programme for the Control of Blindness' XII five-year plan[2] emphasised the need for community engagement and awareness including but not limited to, developing local partnerships, training community health workers and running

health promotion activities. In eye care, these schemes have found real life application in the form of Vision Health Guardians, Vision Centres (VCs)and outreach camps.[3]

As a community-based eye care organization we have a pyramidal[3] network consisting of one tertiary hospital, five secondary hospitals and 35 VCs, spread across north India. While four of our secondary centres (SCs) are semi-urban, one centre is purely rural and located in the Mohammadi region of Kheri district, which according to the recent census had 88.5% population resident in rural villages.[4]The SCs provide services to walk-in patients, i.e. patients making appointments and paying for services. However around 60-70% of the patients at these SCs are provided services free of cost. These patients reach the hospital via the services modelled at primary level which consist of two models, outreach camps and the vision centres in their network.

Camps are conducted to screen and identify patients with operable cataracts.[5]Those identified are provided surgery at the base hospital, as well as transportation to and from, free of cost.VCs are permanent facilities that provide primary level eyecare to a population of around 50,000 people. They are based in rural 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 followed by referral of surgical cases to the nearest surgical secondary or tertiary hospital.

The purpose of this article is to present two case studies which highlight the impact of collaborative efforts with the community on the effectiveness of these two different models of primary eye care delivery. The case studies utilize quantitative analysis of retrospective data of some natural interventions in the field, have been approved by the Institutional Review Board (IRB/2018/MAY/17) and follow the tenets in the Declaration of Helsinki.

Materials and Methods

Case Study 1- Outreach Camps

Indian districts are further divided into administrative blocks to monitor development. Data from camps conducted in two such blocks of Mathura district in north India was analysed. Baldeo block consists of 105 villages with a population of over 186,138 people and Naujheel block consists of 76 villages and a population of 183,231 people. Our surgical SC in the district, which conducted these camps, started in mid-2014, so the outreach team and services had stabilised by 2015. We started camps in the study blocks in the year 2016.

Camp data from 2016 was compared to that from 2017. During this time period, camps were conducted in the same blocks with the same outreach camp team. We have written protocols for site selection, camp publicity, camp implementation process, referral pathway and post camp follow-up of the patients identified for surgery. These remained constant and were followed during both time periods. In both the years, camps were conducted in villages for the rural population. In between the two years, certain standardized interventions were made across camps conducted in both blocks, targeted at engaging with the community through awareness activities. Local leaders from each block were invited to visit the SC and observe our work. Regular health-talks on eye care were held periodically in the villages. In Baldeo, an Ayurvedic (alternative medicine) doctor from the local community, who got connected with our work, not only helped by referring patients but also actively counselled cataract patients in the camps. Similarly, a retired school teacher in Naujheel, who was travelling actively in villages for his teaching assignments, played a crucial role in spreading awareness regarding our organisation and eye care in general. Both of them had interacted with our teams and visited our SC. Neither community leader was provided any financial

incentive or compensation for their role.

Camp attendance, proportion of people over 50 (as cataract and visual impairment is predominant in that age group), proportion of people getting operated among those advised (acceptance of surgery) and acquisition cost, as indicators of camp efficiency were analysed.[6]Acquisition cost is the cost incurred while bringing one patient for cataract surgery to hospital and was calculated by adding the cost of publicity, food, staff conveyance, patient pick-up and drop, staff salary for camp hours and some miscellaneous expenditures and dividing that by number of patients brought to the hospital for surgery. This cost was borne by the hospital.

Data was extracted from the Post Camp Report, made from the register maintained in the camps; data on surgeries was retrieved from Operation Theatre Report of the Integrated Hospital Management System. R software version 3.1.1 and Excel 2013 were used to perform a two tailed t-test for the difference in mean and a two tailed z-test for the difference in proportion; p-value of less than 0.05 was considered significant.

Case Study 2- Vision Centres

Our rural SC in Kheri district has six VCs, located in different blocks adjoining the SC. Two of these VCs were underperforming and via some field based interviews and observations, lack of community engagement was found to be the main reason. Nearby camps being conducted by the VC staff were stopped, instead, VC attendants were trained and given a schedule to conduct regular health talks and meetings in nearby villages. There was repeated interactions with local leaders in the villages within 5 km of the two VCs

This intervention was implemented in February 2018 and data from April to September 2018 was compared to data from April to September 2017. The two major parameters studied were the number of walk-in patients at the VCs and the patients getting operated for cataract at the SC after referral from these centres. Data was extracted from the Vision Centre Management System and analysed using the Wilcoxon Signed Rank test on R software version 3.6.1.

Resultsand Discussion

In both camps and VCs the efficiency parameters showed improvement in the second year of operation. The reduction in acquisition cost in camps is especially important as most of these outreach activities are carried out by organisations working in resource constrained settings.

In Naujheel, eight camps were held in both the years. In the first year 868 people were screened which increased to 1279 in the subsequent year. In Baldeo, 2691 people were screened in 26 camps in 2016 as compared to 1365 patients in eleven camps in 2017. In both the blocks, people screened per camp, proportion of people over 50 years of age, surgeries resulting from each camp (Table 1) and the percentage acceptance of advised surgery (Figure 1) were significantly more (p<0.05) in 2017. This also led to a drastic decrease in the acquisition cost in 2017 (Table 1, p<0.05).
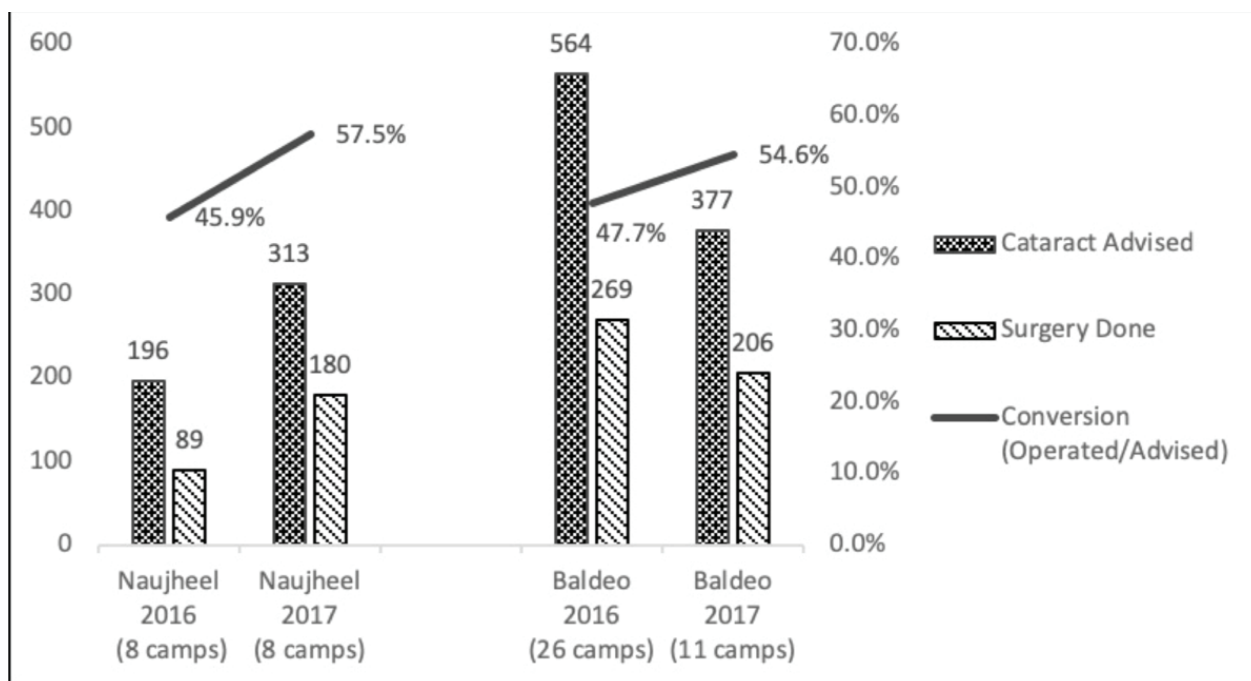
Figure 1: Acceptance of cataract surgery at two blocks [Original].

Table 1: Performance parameters of outreach camps and vision centres [Original].

Outreach Camps						
Parameters	**Baldeo**			**Naujheel**		
	2016	**2017**	**P-value**	**2016**	**2017**	**P-value**
Patients Screened Per Camp	104	124	<0.05	108	160	<0.05
Proportion of over 50-year olds screened (%)	51.5	69.4	<0.05	56.5	68.6	<0.05
Cataract surgeries resulting per camp	10	19	<0.05	11	22	<0.05
Acquisition cost in Indian Rupees (USD) per operated patient	Rs. 552 ($7.5)	Rs. 314 ($4.3)	<0.05	Rs. 513 ($7.0)	Rs. 261 ($3.6)	<0.05
Vision Centres						
Parameters	**Vision Centre 1**			**Vision Centre 2**		
	2017	**2018**	**P-value**	**2017**	**2018**	**P-value**
Average walk-in patients per day	4	15	<0.05	7	14	<0.05
Surgeries accepted (in the absence of camps in 2018)	59	144		250	206	

In VCs, average walk-in numbers improved from four and seven per day to 15 and 14 per day respectively. In the six month period before the intervention, the VCs had together contributed 309 cataract surgeries from walk-in patients and the patients from the camps conducted by them. This number increased to 350 surgeries, from just the walk-in patients, as the camps in the vicinity were no longer conducted. The before and after results are detailed in Table 1.

Previous studies have found fear of eye damage, ageism, fatalism, discounting of self-health in lieu of familial responsibilities and lack of perceived need, to be barriers affecting patients' decision to access eye camps.[7]Our case study of two blocks in the Mathura district found that developing channels of communication with the community, through local leaders and engaging in smaller groups helped increased the number of patients screened per camp, especially in the 50-plus age group. Moreover, the acceptance of cataract surgeries per camp almost doubled in the time-period. Alleviation of barriers to cataract surgical acceptance[7]felt by the community can be attributed to positive re-enforcement by local partners who created awareness regarding the services provided, and their need, as well as established trust in the organization. These findings are in line with results reported from south India where regular outreach camps built trust in the community regarding the service provider.[8]

A similar trend was seen in the case study pertaining to vision centres as well. Conversing with the local community set the ball rolling to increase awareness regarding eye care and the services available at the vision centre. Earlier studies have shown the need for such awareness campaigns as lack of perceived need is a commonly reported barrier to access of eye care services.[9] Vision Health Guardians in south India are another application of such interventions to increase community engagement. They conduct regular outreach and awareness activities to increase linkages of the local community with the VC and bring them in the ambit of its' services. Similar interventions can also be extended to the delivery of health care in general as has been demonstrated earlier.[10]

Conclusion

Sustained presence in one location increases appreciation regarding the quality of services, and facilitates community engagement. The resulting improved collaboration with local stakeholders in the community enhances the efficiency of outreach services. Our case studies are unique in two ways. Firstly, they provide quantitative results of this often advocated concept and secondly, they highlight the fact that these results can also be achieved in relatively short duration. Additionally, these case studies reiterate the importance of collaborations and consistency of services at a fixed location, regardless of the model of eye care delivery at primary level.

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A Year Into the Pandemic: A Mathematical Model and Study of COVID-19 in India

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Abstract

COVID-19 has been declared as a global pandemic by the World Health Organization (WHO) since its outbreak in December 2019. In India, as of May 12th 2021, the total number of coronavirus cases and associated deaths are 2,35,57,676 and 2,56,617 respectively. To control the spread of the virus effectively, social distancing, self-isolation and quarantine, lockdowns and mass inoculation are vital. In this paper we propose a deterministic epidemic model which is an extension of the SEIR model to understand the disease dynamics. The proposed model has eight compartments, Susceptible1, Susceptible2, Exposed, Infected, Quarantined, Isolated, Recovered and Dead and is termed as the $S_1S_2EIQJRD$ model. The basic reproduction number R_0 is derived for the proposed model and it is shown that for $R_0 < 1$ the disease dies out and for $R_0 > 1$ the disease is endemic. Numerical simulations for the growth of the virus across India through the span of the outbreak are obtained. The simulation is done on real data and the results obtained may be used to make suitable inferences about the dynamics of the disease and appropriate measures can be taken to control its spread.

Keywords : *COVID-19, Mathematical Model, Comorbidities, Basic Reproduction Number, Numerical Simulation*

Introduction

COVID-19 was detected for the first time in December 2019 in Wuhan City at Hubei Province in China. The virus soon spread to the rest of the world and on March 11, 2020 the World Health Organization (WHO) declared the novel coronavirus outbreak a global pandemic[1]. As on May 12, 2021, over a year since the outbreak occurred, the world has witnessed 160,417,576 confirmed cases and 3,333,805 deaths[1].

The first case of coronavirus in India was detected on January 30, 2020. The entire nation has been following various preventive measures and the Government of India had also imposed lockdowns throughout the country at various time frames. Despite all the efforts made to curb spread of the virus, India has been extensively affected. As of May 12, 2021, the total number of cases in India are 2,35,57,676 and 2,56,617 deaths[2].

The optimal way to control the spread of the virus is to understand its dynamics. Epidemiological models can be used for prediction of coronavirus (COVID-19)[3]. These models help to estimate the number of COVID-19 patients. Some of the popular mathematical models e.g. SIR, SEIR, SEIJR, SEIAR, and SEIRD[4] are widely used to estimate the future outbreak of communicable diseases.

Kermack et al[5]adopted a fundamental epidemic model for human-to-human transmission through an SIR model that tracks the number of susceptible, infected and recovered individuals during an epidemic with the help of ordinary differential equations (ODE). The SEIR modelpresentedby Zhang et al [6]illustrates the relation among susceptible, exposed, infectious, and recovered individuals. Yang et al. [7]suggested the modified SEIR model for Hubei province in China by introducing the two new parameters move-in and move-out for the inflow and outflow of susceptible individuals respectively. SEIJR model was put forward by Read et al [8]. This is an extended version of the SEIR model. It includes one more factor asymptomatic individual during the incubation period in the SEIR model. It precisely segregates an isolated individual from the other populations. However, it is difficult to collect precise data for individuals which makes it difficult to get the best-fit parameters.Chen et al. [9] recommended the SEIAR model which incorporates asymptomatic infections and population migration into SEIR. Memon et al [10]adopted an SEIQJR model for Pakistan to assess the role of isolation and quarantine to control the spread of COVID-19. The model examines the dynamics of six classes: susceptible, exposed, quarantined, infected, isolated and recovered individuals. Kumari et al[11] illustrated the SEIAQRDT model by extending the generalised model given by Peng et al[12]for India and its states by incorporating asymptomatic cases as a new compartment. Theeight compartmental model incorporates factors such as susceptible, exposed, infected, asymptomatic, quarantined, recovered, dead, and insusceptible. Chowell et al [13]have proposed a modification to the SEIJRD which has two susceptible classes, S_1 and S_2, which accommodates for the population with comorbidities for SARS.

In this paper we propose an extension of the SEIRD model with the addition of compartments for Isolated and Quarantined population. The presence of comorbidities has also become an important factor in the mortality of the infected individuals. Hence, the proposed model has two separate compartments to account for difference in susceptibility of individuals with and without comorbidities where individuals with comorbidities being more severely infected. In total, the proposed model has eight compartments, susceptible1 (S_1), susceptible2 (S_2), exposed (E), infected (I), quarantined (Q), isolated (J), recovered(R) and dead (D).

The rest of the paper is organised as follows. In Section 2, a model is proposed and discussed to understand the growth of the coronavirus. In Section 3, the expression for the reproduction number of the proposed model is derived and Section 4 displays the numerical simulations of the growth of the virus in various parts of India across the span of the outbreak and Section 5 finally concludes the paper.

Model Formulation

In this section, we introduce a mathematical model to understand the increase and spread of the coronavirus. The proposed model is an extension of the SEIR model[6]with inclusion of populations with difference in susceptibility. It also has separate classes for quarantined and infected. The reproduction number[14]of this model is also discussed in this section.

The proposed model has eight compartmental states, S_1S_2EQIJRD is shown in Fig 1. $S_1(t)$ represents a population $N\rho$ with increased susceptibility and$S_2(t)$ represents a population $N(1-\rho)$ with lower susceptibility at time t where N is the total population. $E(t)$represents the exposed population who are infected with the virus but do not infect others within the latent period. $Q(t)$represents the population who are exposed but are quarantined, thus not infecting others. $I(t)$represents the exposed population who show symptoms of infection and

are infecting others by not being quarantined. J(t) represents the population who have been confirmed to be infected and hence isolated. $R(t)$ represents the population who have recovered and $D(t)$ represents the deceased population. The compartmental diagram is shown below.
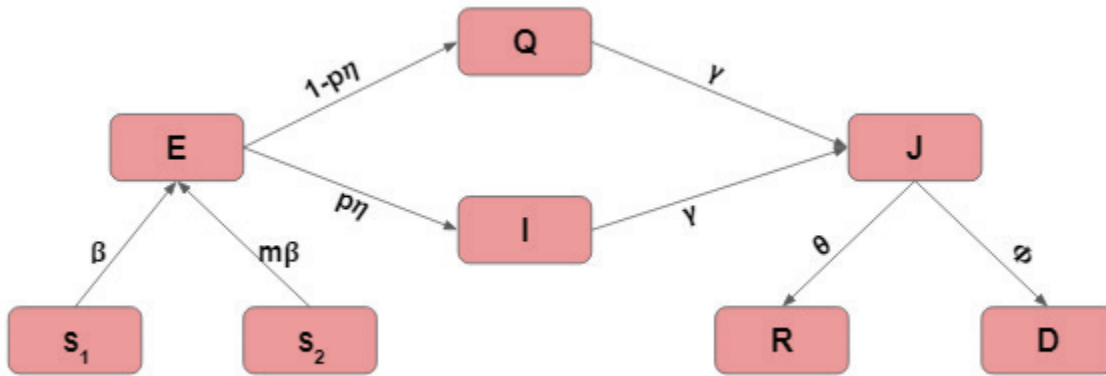
Fig 1: Compartmental Diagram

The system of ordinary differential equations which describe the compartmental model are as follows:

$$\frac{dS_1(t)}{dt} = \frac{-\beta S_1(t)[I(t) + qQ(t)]}{N} \tag{1}$$

$$\frac{dS_2(t)}{dt} = \frac{-m\beta S_2(t)[I(t) + qQ(t)]}{N} \tag{2}$$

$$\frac{dE(t)}{dt} = \frac{[S_1(t) + mS_2(t)][I(t) + qQ(t)]}{N} - \eta E(t) \tag{3}$$

$$\frac{dI(t)}{dt} = p\eta E(t) - \gamma I(t) \tag{4}$$

$$\frac{dQ(t)}{dt} = (1-p)\eta E(t) - \gamma Q(t) \tag{5}$$

$$\frac{dJ(t)}{dt} = \gamma[Q(t) + I(t)] - \phi(t)J(t) - \theta(t)J(t) \tag{6}$$

$$\frac{dR(t)}{dt} = \theta(t)J(t) \tag{7}$$

$$\frac{dD(t)}{dt} = \phi(t)J(t) \tag{8}$$

With initial conditions $S_1(0) > 0$, $S_2(0) > 0$, $E(0) > 0$, $I(0) > 0$, $Q(0) > 0$, $J(0) > 0$, $R(0) > 0$ and

$$D(0) > 0.$$

The total population is assumed to be constant, which is represented by

$$N = S_1 + S_2 + E + Q + I + J + R + D$$

Table 1: Parameters and their definition

m	Probability of lowering risk of infection in S2
p	Probability of symptomatic disease
β	Infection Rate
η	Inverse of average latent time
γ	Isolation Rate
$\theta(t)$	Recovery Rate (time dependent)
$\phi(t)$	Death Rate (time dependant)
ρ	Initial proportion of the population at higher risk
$q\beta$	Transmission rate for Q class

Basic Reproduction Number

The basic reproduction number R_0 is a dimensionless quantity that plays a vital role in the study of infectious diseases[15]. It is 'the expected number of secondary cases produced, in a completely susceptible population, by a typical infective individual' [16]. The original infectious person can transmit disease in a population where each individual is susceptible. If $R_0 < 1$ the disease-free equilibrium is locally asymptotically stable and the disease is under control. On the other hand if $R_0 > 1$, then the disease-free equilibrium is unstable and a pandemic exists in the population[17]. Thus in order to control the pandemic, COVID-19, the reproduction number should be made smaller than one.

For the given system a disease-free equilibrium exists where $S_1 = N\rho, S_2 = N(1-\rho)$ and $E = I = Q = J = R = D = 0$. R_0 is mathematically computed using the next generation matrix method [18]. We consider the nonnegative matrix $\mathcal{F}$ and the non-singular M−matrix $\mathcal{V}$. $\mathcal{F}$ is expressed as the production of new-infection and $\mathcal{V}$ as the transition part for the given system.

$$\mathcal{F} = \begin{pmatrix} \beta[S_1(t) + mS_2(t)][I(t) + qQ(t)/N] \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

$$\mathcal{V} = \begin{pmatrix} \eta E(t) \\ \gamma I(t) - p\eta E(t) \\ \gamma Q(t) - (1-p)\eta E(t) \\ \dfrac{-\beta S_1(t)[I(t) + qQ(t)]}{N} \\ \dfrac{-m\beta S_2(t)[I(t) + qQ(t)}{N} \\ \gamma[Q(t) + I(t)] - \phi(t)J(t) - \theta(t)J(t) \\ \theta(t)J(t) \\ \phi(t)J(t) \end{pmatrix}$$

The variation matrix of the given model at disease free state gives

$$F = \begin{bmatrix} 0 & \beta[\rho + m(1-\rho)] & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$V = \begin{bmatrix} \eta & 0 & 0 \\ -\eta p & \gamma & 0 \\ -\eta(1-p) & 0 & \gamma \end{bmatrix}$$

The reproduction number for the proposed system is calculated using equation $R_0 = \rho(FV)^{-1}$ where ρ represents the spectral radius of the matrix $(FV)^{-1}$[19].

$$R_0 = q\beta[\rho + m(1-\rho)][p + q(1-p)]/\gamma \tag{9}$$

R_0 depends upon the major parameters such as infection rate β and the isolation rate γ. Additionally the parameters m, p, q, ρ also affect the value of R_0. As seen from the equation of R_0 the probability of lowering the risk of infection in class S_2, probability of symptomatic infection, transmission rate for quarantined population and the initial proportion of population at a higher risk are all important parameters in determining the value of the reproduction number using the proposed model.

NUMERICAL SIMULATION AND DISCUSSION

In this section we present the numerical simulations for India across different phases of the pandemic as well as the numerical simulations for 4 different states of India during the 2nd wave of the pandemic. The simulated data is compared with the real data in both these cases. The dataset used for the coronavirus cases in India is available at the COVID-19 REST API for India [2]. Due to lack of available data regarding quarantined and isolation population as well as populations with comorbidities or those at a higher risk of contracting the virus, we opt for a simpler compartmental model for numerical simulations[20]. For the purpose of simulation we define a SEIR model as shown in Fig 2 and minimize the nonlinear least squares to estimate the parameters from real data of COVID-19 cases in India. Levenberg–Marquardt (LM) algorithm[21] is used to solve the nonlinear least squares optimization.
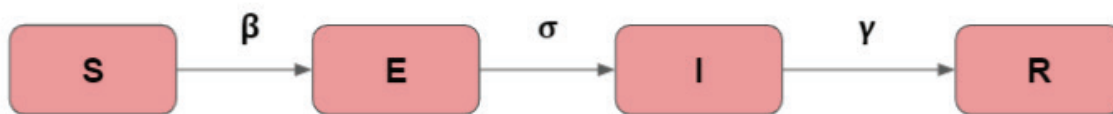
Fig 2: SEIR Compartmental Model

The compartments S, E, I, R refer to the susceptible, exposed, infected and recovered populations respectively. In this model β is the infection rate, γ is the recovery rate and σ is the incubation rate.

The reproduction number for the simplified SEIR model is found to be $R_0 = \beta/\gamma$

Simulation of Data across different phases of the pandemic

The model fitting for cumulative cases from March 10th 2020 to May 12th 2021 is split into 5 phases. Phase 1 is from 10th March and 8th June 2020, Phase 2 is from 9th June to 6th September 2020, Phase 3 is from 7th September to 5th December 2020, Phase 4 is from 6th December 2020 to 4th March 2021 and Phase 5 is from 5th March to 12th May 2021. Table 2 displays the parameter values for the five phases. Figure 4 contains the plots the observed and fitted infections for the five phases.

Table 2: Parameter values of the five phases

Phase	Beta	Gamma	Sigma	R0
1	0.10929	0.05111	2.39085	2.138
2	0.13640	0.08281	0.09042	1.647
3	0.07602	0.09226	0.16513	0.824
4	0.07037	0.10854	0.09117	0.648
5	0.19425	0.08982	0.13147	2.162
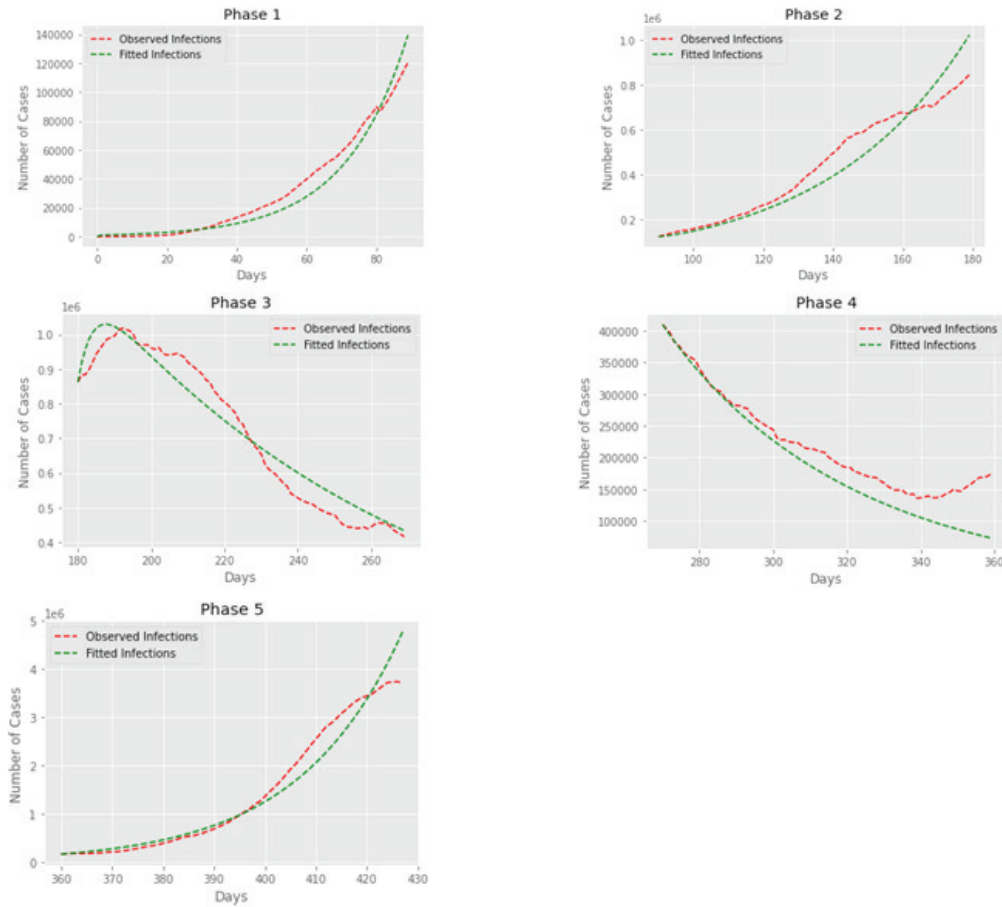
Fig 3: Graphs for observed and fitted infections for the five phases

Numerical Simulation for Indian States

The second wave in India had come into picture in early February when India reported an average of 10,000 cases a day. However, the situation worsened by the end of April when India recorded a total of 4,00,000 cases in a day. This surge in the number of cases can be attributed to the emergence of new coronavirus variants such as B.1.1.7 and B.1.617. This section discusses the coronavirus trends in a few states of India for the time period of 4th March 2021 to 12th May 2021.

Table 7: Estimated parameters for Indian states

State	R0 value	Beta	Sigma	Gamma
Karnataka	3.7846	0.1775	0.1278	0.0469
Tamil Nadu	2.6199	0.3285	0.0826	0.1255
Andhra Pradesh	1.9431	0.1556	0.9987	0.0801
Odisha	1.8280	0.1850	0.7172	0.1012
Haryana	3.1344	0.2962	0.0890	0.0945
Himachal Pradesh	2.0519	0.1658	0.3396	0.0808
Rajasthan	6.5052	0.3090	0.0564	0.0475

The relationship between R_0 (reproduction number) and β (infection rate), γ (recovery rate) was found using correlation coefficient. The correlation coefficient between R_0 and β is 0.529, and between R_0 and γ is -0.650. This signifies that as β increases R_0 also increases and conversely as γ increases R_0 decreases. Figure 8 is a plot to visualize the relation between β, γ, and R_0.
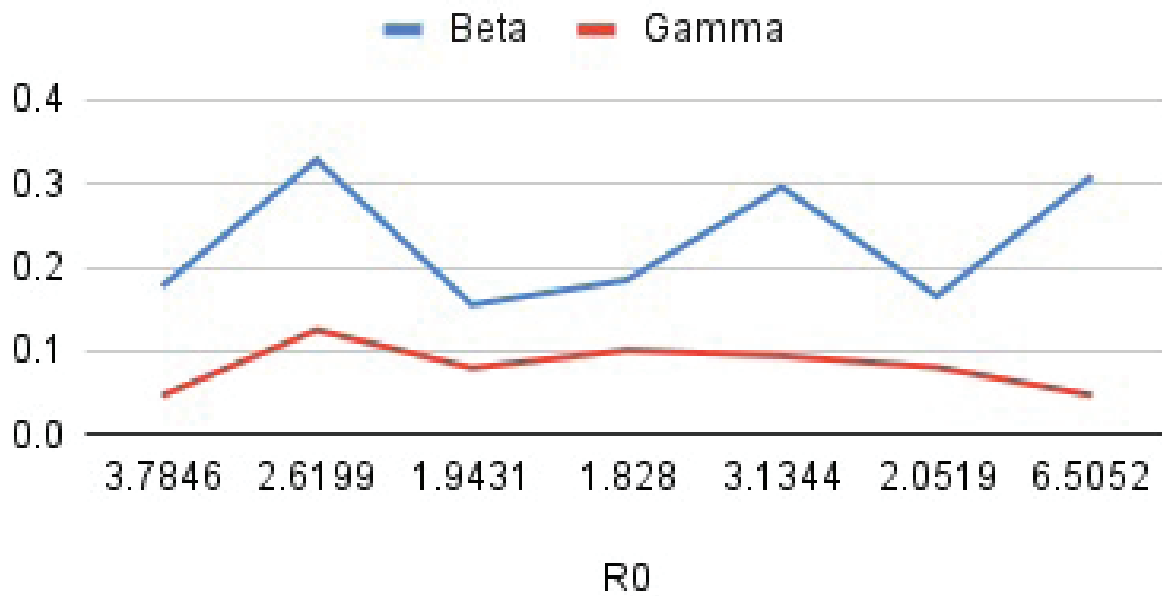
Fig 4: Relationship between beta, gamma and R_0

The following figures are numerical simulations of the observed infections versus the fitted infections by the SEIR model. From the graphs it can be seen that the states of Tamil Nadu and Odisha have an early spike in the number of cases, from day 395 which is early April. The states of Karnataka, Andhra Pradesh, Rajasthan and Himachal Pradesh followed the trend a week later. This period of early April to mid-May was when India was worst hit by the second wave. On May 9, 2021, the daily number of cases recorded was 4,14,188 making it the highest ever. After reaching the peak it can be observed that there has been a gradual drop in the number of cases in all of the above states beyond day 420. This indicates the end of the second wave in late May.
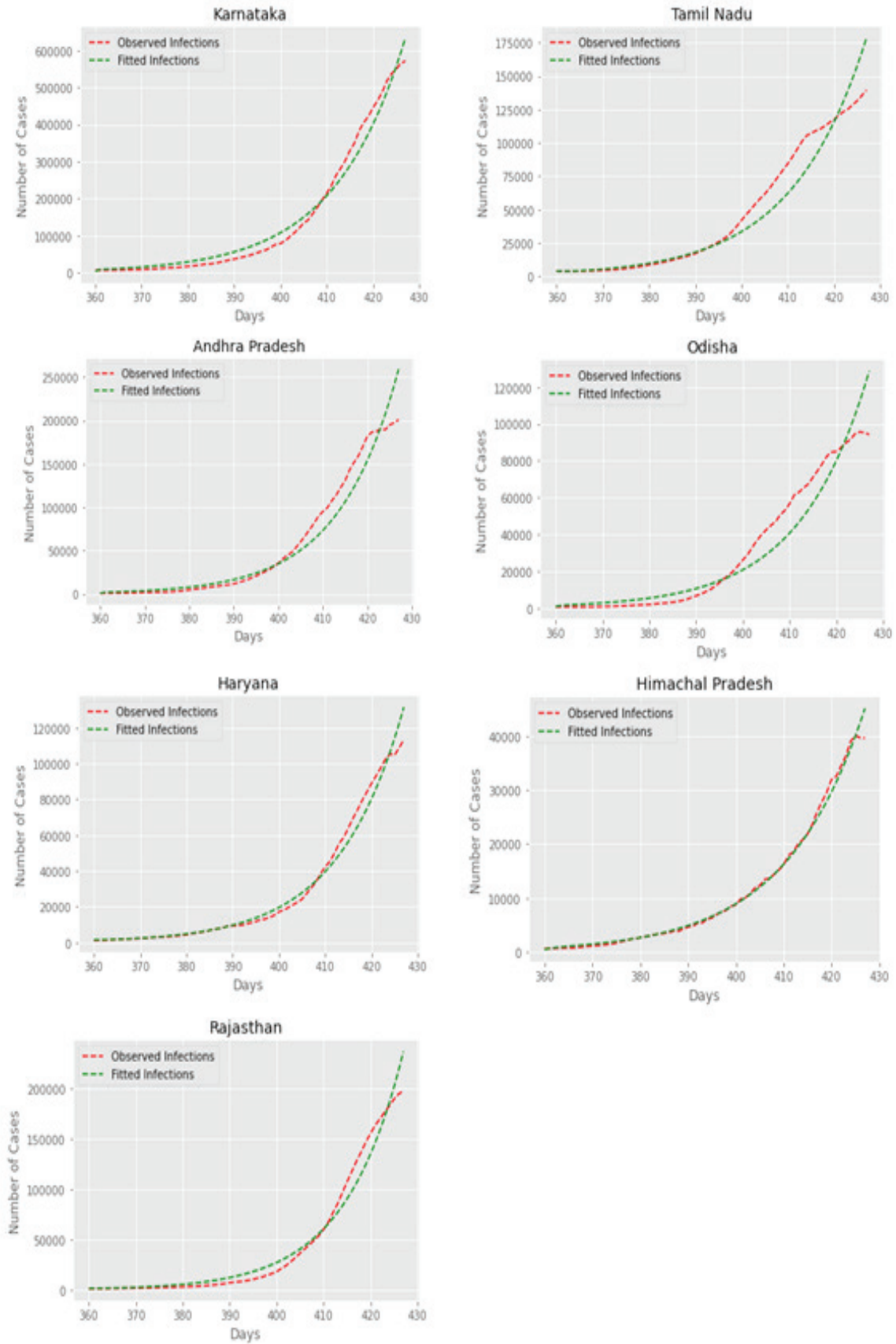
Fig 5: Observed and Fitted Infections for Indian states

Conclusion and Future Work

Combining the SEIR model with the dataset by the Government of India, the median reproduction number, R0 for India has been estimated to be 1.647 till the 12th of May 2021. A detailed analysis of R_0 across India over 5 phases has displayed fluctuations in its estimated values driven by the rise and fall of the number of cases. In phase 1, initial stages of pandemic, the value of R_0 is 2.138. With the introduction of travel restrictions and strict regulations, R_0 dropped to as low as 0.648. However, due to relaxation of the lockdown norms, the value of R_0 increased to 2.162 in phase 5 indicating the second wave of the pandemic. In the analysis done for a few states of India, it can be observed that the states experienced a sudden increase in the number of cases and also a gradual drop around the same time.

On comparing the model predictions with the observed cases reported, it can be seen that the model does not accurately capture the rapid rise or fall in the number of cases. This drawback can be attributed to the fact that the SEIR model does not take into account the comorbidities present in susceptible populations, as well the isolated and quarantined cases. With adequate amounts of data for the mentioned cases, the 8 compartmental proposed model can be used for accurate predictions.

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Challenges in Contact Tracing and Sampling in Three Districts of Western Rajasthan during the COVID-19 Pandemic

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Abstract

Introduction : Contact tracing commenced in districts of Western Rajasthan in March 2020 to control the spread of Covid -19.It was an ongoing process involving isolation and sampling of contacts. Multi department Quick and Rapid response teams (Q/RRT) worked continuously as the pandemic passed through different stages. The objectives of the study was to compare the challenges faced during contact tracing and document good practices in place.

Methods: A cross –sectional study was done among contact tracers using a semi structured questionnaire in Google forms in three districts of Pali, Jodhpur and Barmer. Keeping power of study at 80%, 5% error and 95% confidence interval, assuming 50% prevalence of effective contact tracing and 10 % non-response total 400 , i.e 133 participants from each district.

Results: Major challenges faced by tracers were resistance to contact sampling (64%)lack of training (49%), and random sampling workload (47%). Overall 36% of contacts had downloaded the Aarogya setu app but among them only 68% were using the app. Trainings , workload distribution and inter-sectoral coordination was best in Jodhpur, Barmer and Pali respectively .

Conclusions: Trainings helped in better field management of resistance to sampling among contacts. Excessive workload of lab technicians lead to errors in reporting. Transport for sampling of contacts was a challenge in remote areas. The Aarogya setu app was not used by all contacts. Regular feedback meetings by local administration helped in effective contact tracing

Key words*: Contact tracing, challenges, inter sectoral co-ordination*

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Background

Coronavirus disease 2019 caused by the SARS-CoV-2 virus spreads from person-to-person through droplet and contact transmission[1]. In order to break the chains of human transmission certain interventions are required to ensure that each confirmed case generating new cases is maintained below one

(effective reproduction number < 1)[1].

Contact tracing is the process of identifying, assessing, and managing people who have been exposed to a disease to prevent onward transmission .It is an essential public health tool for controlling outbreaks and requires systematic implementation [2].Contact tracing for COVID-19 required identifying persons who may have been exposed to COVID-19 and following them up daily for 14 days from the last point of exposure[2]. In India as part of a comprehensive strategy following the WHO strategy of track, trace and treat the processes of case identification, isolation, testing , tracing contacts and ensuring their quarantine, were critical activities to reduce transmission and control the epidemic[2].

The Indian Government closed entry for all international travellers to contain the spread of COVID-19 by 22nd March, 2020[3]. This was done with an intention to focus on the second stage of control measures targeted to active case finding and contact tracing following the test ,track and Isolate guideline of WHO within the Indian subcontinent[4]. The country went for total lockdown across all states on 24th March 2020 to stall the surge of cases[5].

For effective contact tracing district authorities had to rapidly develop their capacity to test suspect cases in a timely manner[6]. Where this was not possible, testing and contact tracing strategies focussed on specific high-risk settings with vulnerable individuals, such as hospitals, care homes, or other closed settings (e.g. dormitories) and utilized the testing facility of neighbouring district. It was necessary to quarantine contacts to reduce secondary transmission as positive individuals could transmit COVID-19 in both pre-symptomatic and/or asymptomatic stage [7].

The activities in Contact tracing included contacts to agree to daily monitoring, to be willing to report signs and symptoms of COVID-19 promptly, and to be prepared to go into quarantine for at least 14 days or into isolation if they become symptomatic. Communications and inclusion of communities and their leaders helped to overcome challenges like language and literacy barriers ,access to food and medical care for other illnesses, education, information, as well as stigma and marginalization during the 14 day home isolation period[8] . Special efforts n had to be made for contact tracing of at-risk and vulnerable groups, minority groups, homeless persons, migrant workers, refugees, and others.

Communities had concerns about privacy and confidentiality of their personal health information[9]. Public health agencies implementing contact tracing for COVID-19 had to sometimes communicate how information was used, stored, and accessed, and how individuals were protected from harmful disclosure or identification. It was critical that contact tracing and associated steps, such as quarantine of contacts and isolation of cases, not be used punitively or be associated with security measures, immigration issues, or other concerns outside the realm of public health.

In the initial guidelines a contact was defined as anyone with the following exposures to a COVID-19 case, from 2 days before to 14 days after the case's onset of illness with the following criteria [2, 3]:

• Being within 1 metre of a COVID-19 case for >15 minutes;

• Direct physical contact with a COVID-19 case

• Providing direct care for patients with COVID-19 disease without using proper personal protective equipment (PPE);

•Other definitions, as indicated by local risk assessments were also outlined.

The Aarogya Setu app launched by the Indian government evaluated users' risk of infection based

on location, and their medical and travel history[10]. It used Bluetooth and location services to trace a user's contacts. While authorities said use of the app is voluntary, it had been made mandatory for food-delivery workers and some other service providers, and all government employees. It also helped to access public transit and airports when the nationwide lockdown lifted, according to local media reports.

To identify contacts, a detailed case investigation form was filled and interview with the COVID-19 patient or their caregiver was done [11]. Contact tracing commenced in all 3 districts of Western Rajasthan in March 2020 after the first cases got reported and was an ongoing process involving identification and isolation of positive contacts[6]. But contact tracing and sampling had its challenges and limitations and was abruptly stopped as a strategy in areas when cases subsided after September/October 2020.

On May 1 the Union Home Secretary issued new guidelines under section 10(2) (I) of the Disaster Management Act, 2005, that designated districts into Red, Orange, and Green Zones based on risk. Green Zones are those that had no cases as of the date of the guidelines or within the previous 21 days; Red Zones were designated based on the "total number of active cases, doubling rate of confirmed cases, extent of testing and surveillance feedback." Orange zones are those that do not fit the criteria for the Green or Red designations. Different districts faced different types of challenges in the execution of this important Public health intervention.

No study has yet been done on the challenges of contact tracing in difficult weather and terrain conditions of Western Rajasthan. This multi district study helps to identify the challenges faced by health care workers engaged in the activity of contact tracing and sampling in Western Rajasthan. It also helps to identify and document various local initiatives and good practices and strategies implemented by the

local administration and the effectiveness of these adopted strategies in different semi –arid districts to overcome the same.

Objectives of the study

1. To study the current challenges of contact tracing and sampling in semiarid urban and rural areas of 3 districts Pali, Jodhpur and Barmer

2. To identify the good practices in overcoming these challenges in each district by district authorities.

Methods

Study Setting- Health care workers (Doctors, ANMs, ASHAs, RRT /QRT members) in three districts of Pali , Jodhpur and Barmer

Study design- Cross –sectional study

Study Period - 5 months

Sample Size: Selection of the Health care workers /participants was done by convenient sampling. For keeping power of study at 80%, 5% error and 95% confidence interval, assuming 50% prevalence of effective contact tracing we got a sample size of 384. Adding the 10% non-response in this gave a final sample size of 400, i.e 133 participants from each district.

Sampling Method-Convenient sampling method

Inclusion criteria:

1. Person from any department involved in contact tracing for at least 2 months.

Exclusion criteria

1. Person from any department involved in contact tracing not giving consent

Data collection and analysis: Data was collected from contact tracers by a validated semi structured questionnaire and was analysed using excel and

SPSS 22 version software in terms of proportions, percentage and Chi-Square test was used for comparisons between district specific proportions .

Results

Major challenges faced by tracers were resistance to contact sampling by asymptomatic contacts (64%) lack of training (49%), and random sampling workload (47%). Overall 36% of contacts had downloaded the Aarogya setu app but among them only 68% were knowing or using the app. On comparison of Barmer, Jodhpur and Pali trainings were best in Jodhpur and hence field problems faced by contact tracers were significantly less [fig 1] .

In the initial phase outbreak clusters were identified and strict containment measures were best seen in Pali .Varied quarantine care facilities at designated COVID centres added to the fears of the positive cases to divulge information regarding their contacts. Barmer district showed better workload distribution among the lab technicians and the public was less resistant to contact tracing [Table1]. Inter -sectoral participation by Police department was best in all three districts followed by local administration , ICDS department (18%) followed by traffic police cum home guards.[fig 2]

Comparison of output and outcome indicators [Table 3] of the three districts shows that although 80% of contacts were identified within 24 hours of declaration of a positive case only 40-60% among them were finally sampled and finally quarantined. As resistance to giving samples was high in Jodhpur and only 60% of contacts were tested as compared to 75% from Pali and Barmer. The positivity rate amongst contacts was 30%, 10% and 5% respectively in Jodhpur, Pali and Barmer.

Miscellaneous feedbacks from respondents common to all districts: First level contacts were better traced than second level contacts. Many innovations in PPE kit material were initiated to make it comfortable for lab technicians doing contact sampling in scorching heat of summer months Intra and inter district contacts were traced with the help of administration. Twice a day meeting of nodal officers helped in streamlining local problems in contact tracing. Technical and operational guidance was always available from State headquarters through regular video conferencing .

Figure 1. Major Challenges faced during contact tracing in districts of Western Rajasthan during the COVID -19 pandemic.
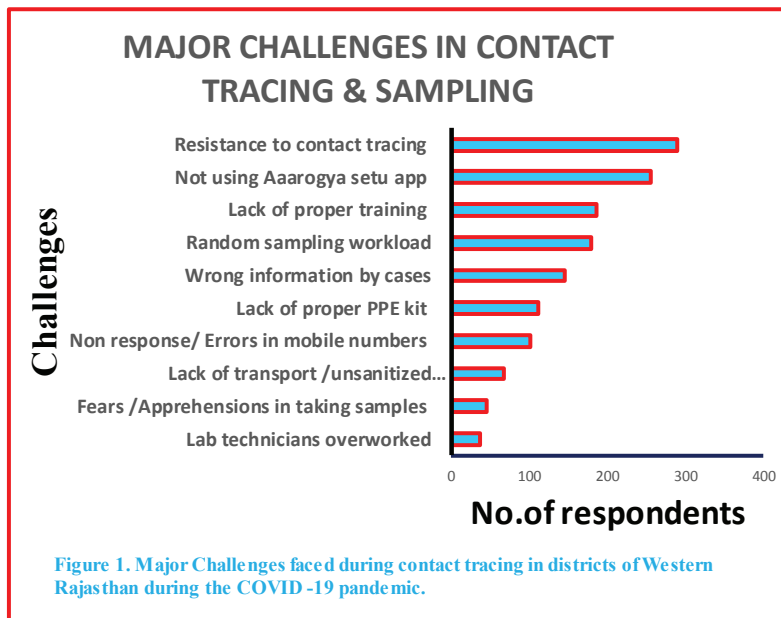
Table 1 Comparison of key factors of contact tracing in all three districts

Variables	Total(n=399)	NAME OF DISTRICT			χ2- Value		p value
		Barmer (n=133)	Jodhpur (n=133)	Pali (n=133)			
Training	318(79.7%)	103(77.4%)	125(94.0%)	90(67.7%)	29.091		0.000
Inter-Sectoral Department Involvement							
ICDS	70(17.5%)	29(21.8%)	17(12.8%)	24(18.0%)	3.777		0.151
Police	104(26.1%)	23(17.3%)	38(28.6%)	43(32.3%)	8.453		0.015
Fire/Security Department	8(2.0%)	1(0.8%)	6(5.4%)	1(0.8%)	5.116		0.056
Traffic Police	9(2.3%)	3(2.3%)	5(3.8%)	1(0.8%)	2.617		0.312
Medical College & Health Department	131(33.0%)	41(30.8%)	58(44.3%)	32(24.1%)	12.624		0.002
Local Administration	77(19.3%)	35(26.3%)	8(6.0%)	34(25.6%)	22.626		0.000
Work Load on LTs							
Over Work Load	247(61.9%)	56(42.1%)	127(95.5%)	64(48.1%)	96.434		0.000
Normal Work Load	152(38.1%)	77(57.9%)	6(4.5%)	69(51.9%)			
Problem Facing by Contact Tracers during Contact Tracing							
Language Related Obstructions	47(11.8%)	21(15.8%)	5(3.8%)	21(15.8%)	12.348		0.002
Hearing Obstructions	27(6.8%)	9(6.8%)	10(7.5%)	8(6.0%)	0.238		0.968
Obstacles in explaining the importance of CT	182(45.6%)	52(39.1%)	55(41.4%)	75(56.4%)	9.476		0.009
Non-Response Inhibition	83(20.8%)	22(16.5%)	29(21.8%)	32(24.1%)	2.404		0.301
Too many over the counter questions from infected person	114(28.6%)	31(23.3%)	34(25.6%)	49(36.8%)	6.853		0.033
Wrong Information	105(26.3%)	28(21.1%)	43(32.3%)	34(25.6%)	4.420		0.110
Lack of leadership and guidance	34(8.5%)	16(12.0%)	5(3.8%)	13(9.8%)	6.237		0.048
Complaints about isolation and quarantine centres facilities by cases	91(22.8%)	31(23.3%)	28(21.1%)	32(24.1%)	0.370		0.831
Resist to Download Aarogya Setu App	75(18.8%)	25(18.8%)	16(12.0%)	34(25.6%)	7.980		0.018
p≤0.05 considered statistically significant and p>0.05 considered statistically insignificant							

Figure 2: Inter-sectoral involvement in contact tracing

Figure 3. Comparison of output and outcome indicators of contact tracing in three districts

Discussion:

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Contact tracing, which is the most basic and important method of stopping transmission in infectious diseases even in developed nations during the Covid 19 pandemic has been riddled with challenges . In a study done in United kingdom tracers failed to get in touch with one in eight contact tracers and 18% of those who were reached provided no details of close contact[12]. Similarly in our study 31.5% did not provide correct information of their immediate contacts. Changing guidelines further complicated this exercise as the first released in India by ICMR and NCDC along with MOHFW on 17th March 2020 was followed by several revisions of the criteria used for identifying contacts[1,2] .

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A study conducted by ICMR on Covid 19 testing conducted between 22 January and 30 April 2020 found 35.9% of patients found positive from testing were comprised of contacts of positive cases [13].In our study positivity rate from among contacts was between 5-30%. In some foreign countries like South Korea , Vietnam , Japan and Taiwan who isolated infected people early and then used data such as mobile based signals to track obedience[14] . Call log tracking by the Police department used for contact tracing in this area was successful only for 5% of the time due to blocking of numbers by the contacts to avoid quarantine or the sim was found to be no longer in use. In some countries authorities used data from credit cards ,mobile phones and closed circuit TVs to trace a person movements and contacts[15] . However in our study it was found that although call log tracing by the police authorities was used no other means were adopted to do contact tracing especially in rural areas . No National or International monitoring was done or data taken from countries to monitor contact tracing efforts or compare failures and document successes. Many Governments suspended the permit for this practice[15].

As the definition of close contacts was those who have spent more than 15 minutes close to the infected person often lead to the exclusion of contacts who did not fit in but repeated cumulative contact time made them a vulnerable lot . In such circumstances they were not sampled as per the given history of the positive case . The WHO criteria were that for successful contact tracing 80% of close contacts should be traced within 3 days[17]. In fact in a single day 75% of cases needed to be isolated and 70% of contacts needed to be quarantined to reduce the R_0 to less than one and slow down transmission. Contacts of contacts were not traced in our areas as per the guidelines due to limited logistics and few COVID quarantine centre facilities. In Rajasthan tracing and being able to quarantine even the first level of contacts was tough and hence the guideline changed to home isolation

Internet connectivity was poor and erratic mobile connections, call dropping, non-response lead to incomplete information .Many times calls were not picked up the second time. Many people did not self-isolate themselves after giving their sample and they became spreaders. No measures were in place to avoid duplicate or repeated phoning of people who were contacts of multiple cases which led to annoyance and resistance from the public. The term 'super spreaders' was used for grocers, milkmen, courier persons ,delivery boys etc.as they were the ones who could spread the infection to an entire family or community they catered[16].

Reverse contact tracing measures were employed wherein super spreaders were traced on the basis-especially useful for cluster tracing, tracing of some big social event[18]. The early lockdown ensured community transmission was substantially delayed. Staff from multiple departments were involved in contact tracing .Undertrained and non health staff found the task difficult but did their best. Containment of a street, locality into zones red, green, orange was a good strategy to grade high risk areas[19] . As cases decreased contact tracing measures also received a set back which perhaps led to reduced surveillance on the transmission and non preparedness for the second wave which hit the area with a vengeance[20].

Conclusions

Trainings helped in better field management of resistance to sampling among contacts. Excessive workload of lab technicians leads to errors in reporting. Transport for contact tracers was a challenge in remote areas. Contact tracing was continued in spite of community transmission in many areas causing unnecessary diversion of resources. The Aarogya setu app was not used by all contacts. Regular feedback meetings by local administration helped in stream lining multiple contact tracing modalities.

More awareness about contact tracing in pandemics will reduce challenges of tracers. Good trainings and optimal workload to contact tracers and lab technicians would give better outcomes. Regular feedback meetings to ensure inter sectoral co-ordination by local administration helps in effective contact tracing. Limited data was available to monitor contact tracing in various states of India and comparison of contact tracing performances has not been done seriously to document lessons learnt for future pandemics . More effective apps to enable self filled information among literates and semi literates as an investment in our Public health system is the need of the hour.

Ethical Clearance: Institutional Ethical Clearance (from GMC Pali) was obtained and informed written consent was taken from all participants.

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Knowledge, Attitude and Practice Towards Covid-19 among Community Pharmacists in Tripoli - Libya

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Abstract

This research aims in measuring the level of knowledge, attitude, and practice towards COVID-19 on community pharmacists in Tripoli, Libya. A cross-sectional survey was performed utilising an online questionnaire from the 1st to 27th March 2021. Data were gathered from a random sample of 260 community pharmacists (CPs) in Tripoli. Of the 260 participants, most respondents (71.66%, n = 187) had a good knowledge level about COVID-19. Moreover, approximately (88.23% n = 229) of the participants had positive attitudes. Most of the participants (84.35%, n = 219) had good practice levels against COVID-19. Educational level was associated with knowledge attitudes and pharmacist practices (p <0.05). No association was found between employment type with attitudes and pharmacist practices, while the experience was not associated with attitudes. There was a difference in the degrees of knowledge of community pharmacists in marital status, age, experience, level of education in relation to COVID-19. The only difference occurs in the CPs attitude scores for education level. Moreover, employment, level of education, marital status, and experience were all associated with levels of practice. The results indicated the existence of differences in the scores of CPs' practices with respect to marital status, experience and qualifications. Regarding COVID-19, good knowledge was observed to be a better indicator of positive attitude (OR: 2.0993, p=0.001) and good practice (OR:1. 828, p=0.049) The requirements for applying the KAP of COVID-19 among CPs are acceptable and require more attention.

Keywords*: Knowledge, Attitude, Practice, Covid-19, Community Pharmacists, Libya*

Introduction

Pharmacists, as members of the health service, played a vital role in controlling, hindering the spread of emerging COVID-19 in the community (International Pharmaceutical Federation, 2020).[1] Individuals with health concerns or who acquire information and advice about a disease often regard (CPs) as trustworthy information sources [2]. Furthermore, they are conveniently accessible to the general public and are widely available in neighbourhood pharmacies. Every country's health policy-makers must urgently comprehend and endorse their vital position in achieving better health outcomes [3]. In Libya, a wide network of community pharmacies is available, according to the last statistics from the Libyan

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Pharmacists Syndicate. Note that in Tripoli, there are more than 3240 community pharmacists. They could potentially undertake a valuable supporting role in COVID-19 prevention and response care.

However, knowing the pharmacist's level of preparedness, such as knowledge, motivation, attitude, and practices, is a prerequisite step for future planning. This study, therefore, attempts to assess the basic COVID-19 associated with knowledge, attitude, and practice among community pharmacists in Tripoli, Libya, especially vulnerable to the devastating impacts of this pandemic due to the Libyan political instability. The country's socio-economic structure and the healthcare system are severely weakened by the struggle for power, which puts Libya in an incredibly vulnerable situation during the COVID-19 pandemic [4]. Additionally, the health professionals in Libya have also contributed negatively to the already shattering health system of the country [4]. Like every other country globally, health authorities in Libya also put standard operating procedures as preventive actions towards COVID-19 to contain its spread, protect its citizens, and determine their good health. However, despite the criteria enforced by the government, the success or failure of these preventive programs mainly depends on the behaviour and understanding of the public [5].

During this pandemic's prevalence time, healthcare teams, including pharmacists, are in charge of delivering reliable knowledge, high-quality service, and illness prevention for individuals with infection by proper prescription. They contribute significantly to the multidisciplinary health system's decision-making process and have a crucial responsibility for medication administration and patient care assessment [6]. Also, along with physicians, pharmacist's knowledge, attitude, and practices are vital for preventing and controlling the disease. The knowledge, attitude, and practices people have towards a disease

have a central role in ascertaining their readiness to adopt behavioural change measures imposed by the health authorities [7]. There is a noticeable gap in the literature regarding current knowledge on COVID-19 among community pharmacists in Tripoli. No study was carried out on COVID-19 knowledge, attitude, and practice of community pharmacists in Tripoli. Following there, this research aims in determining the level of knowledge, attitude, and practice during the COVID-19 pandemic among CPs in Libya. This is to snapshot their current awareness and preparedness as a front-liner during this pandemic.

Materials and Methods

A cross-sectional study engaging the CPs of Tripoli was conducted. Referring to the General Syndicate of Pharmacy in Libya, Tripoli's total number of registered community pharmacists is 1618 (General Syndicate of Pharmacy, 2020). The sample size calculated was 311 participants, measured using Steven Thompson's equation . However, a total of 260 respondents have been considered in the statistical analysis. After filtering the uncompleted duplicates and unusable responses (80.5 % response rate).

Results

In the population of interest, a total of 260 CPs were interviewed during the survey, with females reaching 138 (53.08%), while males 122 (46.9%). The age group from 26 to 40 years was the most representative group with 113 employees (43.50%) and mean age (34 years ± SD 10.48) consisting of (53.08%) females.At the level of education the great majority had a bachelor's degree (BSc) (68.5%), while only 1.20% had a PhD. The pharmacy employees were the highest, with 157 employees (60.40%). These percentages correspond to confirm that the largest group is the youth group of CPs, with experience between 5 to 10 years accounted for 35.40%, which has the highest number of CPs of 92.

Knowledge

COVID-19 was the subject of 14 questions in the knowledge section adapted from previous research [4] with "yes/no/I don't know" basis options. One point was assigned to the correct option answer, and 0 points were assigned to the wrong answer where the knowledge score was calculated accordingly[8]. For more accurate classification, Bloom's cut-off was utilised to classify knowledge scores for the knowledge and practice scores. Scores of ≥80% were considered good, and scores between 60–79% were considered fair. In comparison, scores of <60% were assigned as poor[9]. The maximum total score varied from 0 to 14, with an average knowledge score of 11.3 (SD = 1.5, range 0–14) among the participants. This implies that the pharmacists, on average, achieved 80.71% of the questions correctly ((11.3/14) ×100). A cut-off level score of ≤11.3 indicated low knowledge; meanwhile, a score of ≥12 (more than 80% of the total score) portrayed good knowledge[10]. About (71.66%, n=187) of participants obtained scores above 11.3, considered to have a good knowledge level on COVID-19.

Attitude

As for the attitude domain, the only descriptive analysis reported as frequency, percentage, and mean scores was used to represent responses. Weighted mean was utilised to determine 5 point - Likert scale interpretation of opinions on the CP's attitude toward the COVID-19. There were seven items in the attitude category. On a 5 point - Likert scale responses were coded as strongly disagree=1, disagree=2, uncertain=3, agree=4, strongly agree=5. The overall score goes from 1 to 35, with a score of 28 indicating a negative attitude and 29 (over 80% of the total score) indicating a good attitude. The respondents agreed that the CP's attitude toward the COVID-19 would develop the services provided according to the community's needs. This is indicated by the Likert weighted (mean ± SD) of (3.96 ± 0.64). A cumulative

percentage of answers have been calculated to clarify the study sample opinion. It shows that the total percentage of positive responses to the attitude was (88.23%, n=229). This implies that CPs held a positive attitude towards COVID-19 in Tripoli.

Practice

The third section of the survey consisted of ten questions about CP's practice, with each item being evaluated as 'yes' (1 point), 'no' (0 points), or 'sometimes' (0.5 points). The overall score runs from 0 to 10, with a score less than 8 indicating poor practice and a 9-10 (over 80% of the overall score) indicating strong practice. For more accurate classification of the practice of CPs, scores were classified based on Bloom's cut-off for the practice scores in which scores of ≥80% were considered of good level, and scores between 60–79% were considered fair. In contrast, scoring of <60% were assigned as poor level . Most of the CPs' (%84. 35, n=219) were found to have a good practice level regarding COVID-19.

Chi-Square Tests for Community Pharmacists' KAP, and Demographics data

Chi-Square has been utilised to determine a significant relationship between the CPs' KAP, and demographics categorical variables. Findings revealed that, CPs' knowledge significantly differ by marital status ($\chi2$ = 34.33, p=0.000), age ($\chi2$ = 3, p=0.033), experience ($\chi2$ = 21.35, p=0.000)), and education level ($\chi2$ = 13.05, p=0.000). The result shows that the CPs' attitude significantly differs by one factor only, the education level ($\chi2$ = 4.927, p = 0.002). Moreover, findings demonstrated that employment type ($\chi2$ = 15.709, p=0.000), education level ($\chi2$ = 4.006, p=0.008), marital status, and experience ($\chi2$ = 12.682, p=0.000) were associated with practice levels. The results indicate no association between CPs' KAP, age, and gender. It noted that education level and experience were associated with knowledge

and pharmacist practices (p< 0.05). Additionally, employment type is associated with the level of knowledge, but the experience did not influence attitudes score.

Analysis of variance (ANOVA) showing respondents' demographic predictors of covid19 KAP

One-way ANOVA has been utilised to determine the relationship between the independent variables (participant's demographic attributes) and dependent (KAP). Table 1 shows a difference in scores of CPs'knowledge for marital status, age, experience and education level as the p-value is less than 0.05. Addationaly ,Table1 shows that there is only a difference in the score of CPs' attitudes for qualifications as the p-value is less than 0.05 (p = 0.002). Table 1 shows a difference in the score of CPs'practices in Tripoli for marital status, experience, and qualifications as the p-value is less than 0.05.

Correlation's Matrix Between KAP

The correlation matrix using the Pearson correlation r coefficient is presented to measure the relationship between the mean KAP scores of the community pharmacists. It tests present a linear statistically significant positive correlation for KAP scores with knowledge-practice (r = 0.503, p=0.000), attitude-practice (r = 0.310, p=0.000), and knowledge-attitude (r = 0.210, p<0.001).

Factors Related To A Good Level Of KAPToward COVID-19

The binary logistic regression analysis was used to assess the major drivers of good COVID-19 knowledge, attitude, and practice among Tripoli CPs', as shown in Table 2.

Regression analysis for factors associated with Good KAP regarding COVID-19.

Results revealed significant factors of good knowledge about COVID-19 (OR: 2.0993, 95% CI: 1.589-5.639, p =0.001) and a good attitude (OR: 1.828, 95% CI: 1.001-3.341, p=0.049) that had similar odds of good practice in comparison to reference classification. Positive attitude (OR: 2.0993, p=0.001) and excellent practice (OR: 1.828, p=0.049) were revealed to be possible indicators of excellent knowledge. Knowledge is positively correlated with attitude (r=0.274, p0.001) and practice (r=0.503, p=0.000).

Table 1- Analysis of variance (ANOVA) showing respondents› demographic predictors of covid19 KAP

Factors	Knowledge		Attitude		Practice	
	F-test		F-test		F-test	
	Statistic	P-Value	Statistic	P-Value	Statistic	P-Value
Gender						
Male	0.203	0.653	0.489	0.485	0.14	0.906
Female						
Marital Status						

Table 1- Analysis of variance (ANOVA) showing respondents› demographic predictors of covid19 KAP

Married	34.336	0.000	1.482	0.225	15.709	0.000
Single						
Age						
25 years and less	2.959	0.033	0.843	0.471	0.507	0.678
26-40 years						
41-55 years						
56 years and over						
Experience						
Less than 5 years						
5-10 years	21.353	0.000	0.706	0.549	12.682	0.000
11-15 years						
15 years or more						
Education Level						
Diploma						
BSc	13.050	0.000	4.927	0.002	4.006	0.008
MSc						
PhD						
Employment type						
PharmacyTrainee			0.248	0.863	0.578	0.630
Pharmacy Student	1.475	0.222				
PharmacyEmployee						
Pharmacy Owner						

Table 2- Regression analysis for factors associated with Good knowledge, Attitude and Practice regarding COVID-19

Variables	Knowledge		Attitude		Practice	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Gender						
Male	1.00	-	1.00	-	1.00	-
Female	0.998 (0.568- 1.755)	0.996	0.959 (0.518-1.775)	0.894	0.607 (0.337-1.095)	0.097
Marital Status						
Married	1.00	-	1.00	-	1.00	-
Single	0.766 (0.425-1.382)	0.376	1.144 (0.593-2.206)	0.688	0.583 (0.309-1.100)	0.096
Age						
Less than 25 years	1.00	-	1.00	-	1.00	-
26-40 years	0.462 (0.085-2.519)	0.372	0.936(0.144-6.083)	0.945	0.256 (0.041-1.610)	0.146
41-55 years	0.724 (0.290-1.808)	0.489	1.427(0.582-3.498)	0.437	0.666 (0.237-1.869)	0.440
56 years and over	1.224 (0.450-3.331)	0.693	2.238(0.830-6.033)	0.111	0.519 (0.174-1.548)	0.240
Experience						
Less than 5 years	1.00	-	1.00	-	1.00	-
5-10 years	1.581 (0.609-4.105)	0.347	0.895 (0.332-2.415)	0.827	0.594 (0.215-1.641)	0.315
11-15 years	1.376(0.591-3.205)	0.459	1.829 (0.735-4.552)	0.194	0.908 (0.364-2.261)	0.835
16 years or more	1.488(0.623-3.555)	0.371	1.736 (0.674-4.470)	0.253	0.832 (0.333-2.084)	0.695
Qualification						
Diploma	1.00	-	1.00	-	1.00	-
BSc	3.406 (0.252-46.024)	0.356	2.022 (0.152-26.97)	0.594	-	0.999
MSc	2.941 (0.227-38.138)	0.409	1.966(0.155-24.947)	0.602	-	0.999
PhD	3.708 (0.232-59.353)	0.354	1.541(0.097-24.56)	0.760	-	0.999
Employment						
Pharmacy Trainee	1.00	-	1.00	-	1.00	-
Pharmacy Student	0.583 (0.110-3.086)	0.525	3.528(0.466-26.70)	0.222	1.964(0.315-12.263)	0.470
Pharmacy Employee	0.676 (0.095-4.810)	0.696	3.414(0.312-37.33)	0.314	1.572(0.202-12.211)	0.666
Pharmacy Owner	0.588 (0.285-1.209)	0.149	0.751 (0.360-1.568)	0.446	0.994(0.478-2.066)	0.987
Knowledge	-	-				

Cont... **Table 2- Regression analysis for factors associated with Good knowledge, Attitude and Practice regarding COVID-19**

Poor	-	-	1.00	-	1.00	-
Good	-	-	2.0993 (1.589-5.64)	0.001	1.828 (1.001-3.341)	0.049
Attitude	-	-	-	-		
Poor	-	-	-	-	1.00	-
Good	-	-	-	-	1.147(0.600-2.193)	0.679

Discussion

The details of the community sociodemographic parameters of the participant of this study have been investigated. The age group from 26 to 40 years was the most representative group. The great majority had a bachelor's degree (BSc) (68.5%), while only 1.20% among CPs'hold a PhD. Mixed responses were gained on those 14 knowledge items. The total correct answer rate of the knowledge questionnaire was 80.71%. About (71.66%, n=187) of participants had a good knowledge of COVID-19. These conclusions align with a Libyan KAP study among Libyan health care workers [11] Additionally, this finding is consistent with [2], which reported that of 393 respondents, 71.5% (n=281) had good knowledge in Pakistan. Also, this research finding in terms of knowledge among community pharmacists towards COVID-19 agreed with the results of a study done in Egypt [8] Approximately two-thirds of community pharmacists in Egypt (n=287, 68%) showed good knowledge.

Similarly, in Addis Ababa, Ethiopia, research conducted on community pharmacist's found that more than half (53.2%) have adequate knowledge about COVID-19. Moreover, according to the recently published work in UAE, the majority of respondents (n = 400) had a strong understanding of COVID-19 and were well prepared for pandemic response [15]. Also, more than 90% of individuals had a solid understanding of COVID-19's nature, symptoms,

hazardous groups, and transmission. In addition, 87.7% of respondents mentioned that sunlight stimulates T-helper cells, which boosts immunity, while 99.2% said they should eat foods rich in Vitamin C and D to improve their immunity. On the other hand, 27.3 % were unaware that non-steroidal anti-inflammatory drugs like Ibuprofen could reduce the risk of complications when consumed during viral infections. In comparison, 35.3 % were unaware that the elderly (over 65), the immune-compromised, and children younger than nine years old are at the maximum risk of catching coronavirus. The majority of our research participants had an adequate understanding of COVID-19's nature, symptoms, danger groups, transmission routes, preventative measures, and treatments.

The lack of knowledge among more than 28% of CPs participants could be attributed to the unavailability of continuing education programs and training to face the impact of such a pandemic. Also, the absence of proper medical equipment and the financial crisis directly affects the KAP of community pharmacists [2]. During the peak time of COVID-19, the weak economic condition due to political instability in the capital city of Libya caused difficulty to cope with such outbreaks. The other main reason for these unacceptable results among more than 28% of CPs could be a lack of deliberate policy by the policy-

makers (Ministry of Health) to engage community pharmacists more effectively. Pharmacy is a profession based on knowledge. Because pharmacists' knowledge is connected to professionalism (more knowledge equals better pharmacists), it's critical for them to have an extensive understanding of COVID-19, ultimately improving the quality of service against COVID-19 in our communities. The results obtained agree with most studies investigating CPs, hospital pharmacists, and health care workers in various countries (Egypt, Vietnam, Turkey, Pakistan, Libya, Nepal, and Ethiopia), indicating sufficient knowledge regarding COVID-19 [2,8,11,13-14, 21-23]. Most participants, especially those with higher qualification categories and long experience, may have enhanced knowledge related to nature, risky groups, symptoms, COVID-19 transmission, prevention, and control.

The second variable measured in this research is the attitude of CPs in Tripoli towards COVID-19. Findings demonstrated that 88.23% (n=229) of community pharmacists had a positive attitude towards COVID-19. From overall respondents, 98.1% strongly agreed that pharmacist's play a role in counselling the public regarding the COVID-19 infection and ways to minimise the spread and transmission of the disease (98.8%).Also, 79.2 percent believed that pharmacists play a key role in regulating epidemics and pandemics through their pharmacy by wearing masks and gloves as well as preventing direct contact with patients. (71 %, n =186) agreed that if they believe someone has coronavirus, they know when and where to get medical help as soon as possible to help the patient.

On the other hand, approximately half (50%) of the CPs disagreed that pharmacists should offer hydroxychloroquine to patients who require medication even if they do not have a prescription. This finding is consistent with [2] who reported that of 393 participants, only 44% (n=175) had a positive attitude in Pakistan. Also, this research finding in terms

of knowledge among CPstowards COVID-19 agreed with the results presented by [8]. Here, approximately 63% of the community pharmacists in Egypt showed a predominantly positive attitude. Similarly, a study in Addis Ababa, Ethiopia, conducted on CPs found that the relevance of implementing WHO guidelines in minimising COVID-19 transmission was seen positively by 89.8% of the 295 participants [14].

Furthermore, Malaysians high levels of knowledge were linked to this positive attitude toward health crises [7]. The total favourable attitude percentage in [7] was 54.1 percent, which was less than the figure reported by Bhagavat hula et al. Some literature mentioned that surveyed CPs, hospital pharmacists, and health care workers in various countries (Egypt, Vietnam, Turkey, Pakistan, Libya, Nepal, and Ethiopia) portrayed positive attitudes about COVID-19 [2,8,13,14,20, 21]. Positive attitudes allow pharmacists to apply experiences on the most important findings of research and scientific studies and the latest developments in the field of pharmaceutical care from drug treatment and drug safety management. But the absence and lack of support from officials in the health sector in Libya has a great impact.However, 11.77 % of participants hold a poor attitude in this study due to some factors, some of which may be:

1. Lack of knowledge (this study showed the correlation between knowledge and attitude).

2. Lack of motivation on pharmacists [22]

3. Poor practice settings (this study showed the correlation between attitude and community pharmacists' practice).

Of the total participants, (98.8%) strongly agreed that pharmacists' role in counselling the public regarding the COVID-19 disease and ways to minimise the spread and transmission of the disease [16].

On the practice index, there were ten elements, each of which corresponded to a particular intervention that pharmacists are supposed to conduct. Most respondents had good practice for each item, with the greatest levels of practice in counselling on treatment duration and dose, washing hands, wearing a face mask, implementing clean, neat, non-sterile, long-sleeved protective gown. Overall, the majority of pharmacists (84.35 %, n=219) said they followed appropriate COVID-19 procedures. The respondents claimed that they follow safe and precautionary actions when it comes to COVID-19 infection. [12-14]. In Pakistan, 57.3 percent of community pharmacists (n=225) had strong COVID-19 practice. However, in Egypt [8], less than half (n =171, 40.5%) of CPs were found to have good practice levels.

In contrast, the practice in conjunction with COVID-19 was insufficient at the institutional level in Addis Ababa, Ethiopia [13]. The most common practices that pharmacists always performed were rinsing their hands with soap/hand sanitiser followed by wearing face masks in crowded places. In this research, most respondents possessed good practice related to each item with the highest practice portrayed in counselling about the dose and duration of treatment (95.8%), wearing a face mask (98.5%), washing hands (98.68%), and practice a neat and clean, non-sterile, long-sleeved protective gown (89.6%). Only 75% of the 260 participants said their institution implements enough preventative steps to safeguard employees from COVID-19. To avoid and limit the spread of the COVID-19, regular and adequate training and giving the right funding are the only ways to improve practices. This was concurred by the study that was done in [13]. In contrast, according to the assessment of practice level in the developing countries, only 30.4 percent of the research participants had a strong COVID-19 preventive technique, according to the findings[17].The pharmacist is responsible for providing accurate information about safe drug-taking, such as finding alternative ways to give the drug to patients who cannot swallow, drug interactions, doses, and side effects. In Libya, with personal efforts, CPs have continued, since the beginning of the crisis, to work on developing strategies to continue providing services to the community and strengthening measures to preserve public health, such as pharmacy space. In addition, to ensure that direct contact is reduced, they have developed safer ways to communicate with patients, such as providing consultations through video calls.

The association between CPs KAP of COVID-19 and demographic data has been deeply discussed. It was found that gender and age of CPs did not influence the KAP in delivering care.

In contrast, studies presented in [14,17] found the gender can vary in knowledge level among CPs towards COVID-19. Furthermore, an association has been discovered between the CP's knowledge and employment type, education level, marital status, and experience, as well as education level and experience that have a more significant impact on their level of knowledge. It's worth mentioning that the CP's attitude level is influenced significantly by education level.This result aligns with Chinese research that found no link between experience, age, gender and attitude level[19]. These findings were not consistent with previous studies reported from other developing countries, such as Indonesia, Pakistan, and Malaysia, which found that age and working experience of pharmacists influence the attitude [17, 24].

Pharmacist's type of employment, education level, marital status, and experience influence their practices regarding COVID-19. Other studies reported good practices of CPs had been associated with different factors and assessment tools that cannot be compared to the current study [13]. The reason for CPs in Tripoli having a high degree of knowledge on each area of COVID-19, a positive attitude, and good practice is

because the level of awareness in society, in general, has increased dramatically in 2021 compared to 2020 [11].

This study shows a correlation value between CPs'knowledge and CPs' practice (r= 0.503 at sig. value 0.000), indicating a linear statistically significant positive correlation between them. In other words, more knowledge about COVID-19. leads to more correct scientific practicians of the CPs'. This finding is consistent with the result [2]. They discovered that among community pharmacists in a developing nation, having a strong COVID-19 knowledge was highly correlated with practice (p=0.035). In Pakistan, similar outcomes were found [2]. In contrast, [8]found no correlation between knowledge and practice. Also, there was a moderate positive correlation (r = 0.210, P<0.001) between community pharmacist's knowledge and pharmacist's attitudes. Attitude scores increase as knowledge scores are increasing. This result is closer to the finding presented by [2]. Pearson correlation tests showed a linear statistically significant positive correlation amid knowledge and attitude (r = 0.274, p<0.001), which means that these variables tend to increase together. Additionally, the results indicated that CPs , attitudes, and practices are positively correlated (r = 0.310, p=0.000). It is worth mentioning that the correlation between attitudes and practices was higher than the correlation value between CPs'knowledge and attitudes. But the correlation was not strong as the correlation value between CPs'knowledge and practice. This conclusion totally agreed with [15]. Tripoli's CPs had a better understanding of the disease (COVID-19) with its transmission and severity, prompting them to act with extreme caution to safeguard themselves and their consumers. The studies conducted by [2,21,20,23]specified that pharmacists with good knowledge had a positive attitude and presented good practices.

When compared to pharmacists who were less worried, it can be concluded that those who were more worried had a positive mindset. A positive attitude was revealed to be a possible predictor of good knowledge (OR: 2.0993, P=0.001) and good practice (OR:1. 828, p=0.049). This was also discovered in correlation since knowledge and attitude are both positively associated (r=0.274, p<0.001) and also with practice (r=0.503, p=0.000). The recent studies were conducted in three Arab countries (Jordan, Saudi Arabia, and Kuwait), Indonesia, and Pakistan by [2,20,23,24], signifying that pharmacists with a good level of knowledge possessed a better attitude and portrayed enhanced practices.

Conclusion

This study proposed that experience level and good knowledge and practice on COVID-19 contributed significantly to CPs' preparedness for the pandemic control. The requirements for applying the knowledge, attitude, and practice of COVID-19 among CPs are acceptable and require more attention. There is a need to adopt conferences, seminars and effective training opportunities that promote the knowledge, attitude and practice among community pharmacists who will contribute significantly to community pharmacists' preparedness for pandemic control.

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A Qualitative Study to Assess the Perceptions of the Nurses and Accredited Social Health Activists (ASHAs) Regarding the Prevention of Female Feticide in a Selected District of Haryana

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Abstract

Objective: The objective of the study was to assess the perceptions of the nurses and Accredited Social Health Activists (ASHAs) regarding the prevention of female feticide.

Methods: The study was conducted in Public Health Centres and Community Health centres of Faridabad district, Haryana. An in-depth interview was conducted by using semi-structured interview schedule in order to assess the perceptions of the nurses and ASHA workers regarding the different aspects of female feticide. The recorded data were transformed into verbatim written accounts. Thematic analysis was done and it followed a five-phase process. In phase I, transcripts were read fully without coding the data to gain an overall sense of the views of the study participants. In phase two and three, more detailed transcript review to identify key phrases and words, followed by coding and data reduction was done. In phase four, another researcher individually coded the transcripts and compared those findings to reach a consensus about the explanations.

Conclusion: Qualitative analysis of nursing personnel and ASHAs regarding their perception about female feticide provided deeper insights into the problem of female feticide and its consequences in the society. And it reveals that they are sensitized about this pressing issue and are ready to become the channel of communication to the public for the prevention of the female feticide. It is very necessary that the government and NGOs should systematically organize and orient several programmes to tackle this critical social issue.

Keywords*: female foeticide, ASHAs, perception, nursing personnel, ASHAs, prevention.*

Introduction

Everyone in India claims that the country has come a long way since its independence more than half a century ago. Indeed, the country has made significant scientific and technological progress and churn out some of the brightest minds every year in every area possible. But when the country hears of female infanticide and female feticide, let alone the gender discrimination everywhere else or when the statistics presents the skewed sex ratio, it makes one think that all this progress is absolutely worthless[9]. In this age, when human rights have been in focus internationally, with significant developments made in India as well, it is tragic that gendercide continues unchecked. The constitutional guarantee of equality of the right to life, and its faith in the dignity of every human being seem so futile, when the parents themselves do not want to protect their child and educated doctors do not have

any qualms in flagrantly violating the law[1].

Sex ratio is a sensitive social indicator of development and it shows the status of women in a country. Prenatal sex determination tests followed by quick abortions eliminate thousands of female fetuses. This is due to a mentality that looks down upon the female child as a burden. The fear of dowry on the one hand and losing property in inheritance, on the other, are the major irritants in the acceptance of a girl child[2]. Indicating a continuing preference for boys in the society in India, the child sex ratio has dropped into 914 females against 1000 males[3]. The sex ratio at birth is the most relevant indicator for examining the magnitude of sex-selective abortions[19].In some parts of the country, the sex ratio of girls to boys has dropped to less than 800:1000. The United Nations has expressed serious concern about the situation[4].

The Indian Medical Association (IMA) estimates that five million female fetuses are aborted each year, and estimated in 1999 that India had approximately 20,000 ultrasound clinics, most unregistered and staffed by unqualified doctors. In the Indian states of Punjab, Haryana and Uttar Pradesh, mobile vans take sex-detection clinics to outlying villages. "You will find an ultrasound machine even in a village which has a road over which only a bullock cart can go, and electricity to run the machine and nothing else," said one ultrasonographist, as reported in *The Hindu*, a national newspaper[5]. The problem of female feticide requires urgent attention of all the parliamentarians, the government, the judiciary, the media and the public at large. There is an urgent need to embark on a massive nationwide sensitization and advocacy campaign with specific focus on the importance of girl child to reinforce the view that she is an asset not a burden[6]. The qualitative analysis will help to assess

the perceptions of nursing personnel and ASHAs regarding the problem of female foeticide which will be helpful for the planning of intervention for the prevention of female foeticide.

Materials and Methods

Research approach: The qualitative research approach is used to analyze the perceptions of the nursing personnel and ASHAs regarding the prevention of the female feticide. **Thematic analysis research design** is used to analyze the perceptions of the nursing personnel and ASHAs regarding the female feticide. Thematic analysis is applied to information gained from the interviewing participants transposed to interview transcripts. It emphasizes pinpointing, examining, and recording patterns/themes within the data[7].

The study was conducted in the Public health Centres (PHCs) and Community Health Centres (CHCs) of Faridabad district of Haryana. Purposive sampling technique was used for selecting the sample and the sample size for thematic analysis was 16, which included 12 ASHA workers and 4 Auxillary Nurse Midwives (ANMs).

Development of tools

A semi-structured interview schedule was developed by the investigator and it consisted of 12 open ended questions and an in-depth interview was conducted for the participants in order to analyze the perceptions related to female feticide. The content was recorded; transcribed and thematic analysis was done.**Braun & Clark's (2006)** step-by –step guide for thematic analysis was used for analyzing the content of interview in order to analyze the perceptions of the nursing personnel and ASHAs regarding female feticide.

	Phase	Description of the process
1	Familiarize with the data- re-listen to audio and read transcripts a few times	Transcribing data (if necessary), reading and rereading the data, noting down initial ideas.
2	Generate initial code	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3	Discovering the themes or searching for the theme	Collating codes into potential themes, gathering all data relevant to each potential theme.
4	Reviewing the themes	Checking if the themes work in relation to the coded extract (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6	Writing the analysis/producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis of the research questions and literature, producing a scholarly report of the analysis.

Braun & Clark's (2006)

The tool was sent to the experts for validation. Experts were requested to give their opinion on the adequacy, relevance and appropriateness of each item. Based on the opinion from the subject experts, content validity index of each item and for the total instrument were calculated. The item with content validity index more than 0.8 were selected. The Content Validity Indices of semi-structured interview schedule was 0.8

Data collection procedure

Formal permission was collected from State Appropriate Authority-cum-Director General, Health services, Haryana. Formal permission has also been collected from District Appropriate Authority (PNDT) –cum-Civil Surgeon, Faridabad. The data was collected after obtaining ethical clearance from the institutional ethical committee of St.James College of Nursing, Chalakudy. Written informed consent was obtained from all the participants before data collection and was assured that the information obtained would be kept confidential and used only for the research purpose. After obtaining the formal permission, an in-depth interview was conducted for the participants. The participants gathered in the hall attached to the primary health centre for data collection. Interview lasted for about 15-45 minutes, depending on the participant's ability to express themselves. All interviews were recorded. The interview was video recorded .

Results and Discussion

The recorded data were transformed into verbatim written accounts. Analysis followed a five-phase process. In phase I, transcripts were read fully without

coding the data to gain an overall sense of the views of the study participants. In phase two and three, more detailed transcript review to identify key phrases and words, followed by coding and data reduction was done. In phase four, another researcher individually coded the transcripts and compared those findings to reach a consensus about the explanations.

Description of the participants

There were sixteen participants and all of them were females. Among the participants, twelve were ASHAs and four of them were ANMs. The number of participants from each health centre depended on the total number of samples is as follows: Kaurali CHC-5, Mohanna PHC-3, Chaiinsa PHC-4 and from Dayalpur PHC-4. Participants readily spoke about the topics raised in the interviews.

Table.1. Opinion regarding the female feticide as stated by the nursing personnel and ASHAs

n=16

Sl.No	Suggestions	f	%
1	Female feticide should stop at any cost	9	56.25
2	It is a big sin	3	18.75
3	Female feticide is wrong	3	18.75
4	Gives bad effect on women and society	3	18.75
5	It is a big crime	1	6.25

The immediate response of 56.25% (9) of participants towards female feticide was that it should be stopped at any cost. And 18.75% of the participants opined that it is a big sin, it is wrong and it gives bad effect on women and society.

A few verbatim observations of in-depth interview are as follows:

Female feticide is a sin; if we kill the girl baby,

then how can we worship Devi? Now I became deeply aware about the facts of female feticide because of this movie and class.

Today, the status of girls have increased and they are educated than boys; hence we need to discourage the female feticide. In my family, there are five girls and one brother. My father educated us and we all are living happily.

Table 2. Reasons for the preference for sons as stated by nursing personnel and ASHAs

n=16

Sl.No	Suggestions	F	%
1	Boy carries the name of the family	16	100
2	Boy can take care of the assets	4	25
3	Support provider in old age	2	12.5
4	Earns the money	2	12.5
5	Girl will go to her husband's house	2	12.5
6	Effect of culture	1	6.25
7	Perform the last rites	1	6.25

During the interview, all the participants had the opinion that the main reason for the preference for a son is that the "boy carries the name of the family," though they are not convinced with the answer. It is clear from the response of one ASHA worker: "Since girls only can give birth to a baby, how can we say boys carry the name of the family?" Four (25%) of the participants expressed the reason that the boy takes care of the assets. One ANM added along with this answer, "*People think only a boy can take care of the assets- land, building, agriculture; but girls also can manage that.*"

Table 3. Reasons for the female feticide as stated by the nursing personnel and ASHAs

n=16

Sl.No	Suggestions	f	%
1	Dowry	8	50
2	Poverty	3	18.75
3	Compulsion from husband and in-laws	3	18.75
4	Availability of ultrasound scan	2	12.5
5	Lack of education	2	12.5

The spontaneous response of 50% (8) of the participants for the reason for the female feticide is dowry, followed by poverty (18.75%) and compulsion from husband and in-laws (18.75). The response of one ASHA worker is noted: "*Today, we can't marry a girl without dowry; if there is no adequate money, it creates problems in both the families.*"

Table 4. Perception of nursing personnel and ASHAs about dowry

n=16

Sl.No	Suggestions	f	%
1	Should stop dowry system	13	81.25
2	Cause for many family problems	8	50
3	Husband's family demands more and more	5	31.25
4	Burden for the parents	4	25
5	Cause for the female feticide	4	25

It is noted that 81.25% of the participants responded that dowry should stop at any cost. The following verbatim reveals the mindset of the ASHA worker: "I don't accept the boy who demands dowry. During my proposal time, one boy demanded dowry; I just refused that boy."Another ANM responded: "People think if there is no girl, no need to educate her and no need to give dowry also."

The present study supports the observations made in the study done in Mandya district about the disappearance of daughters and the intensification of gender bias. The study reports:

Boys' parents consider it is their right to collect dowry. They never think about the economic position of the girls' parents No marriage in this village has taken place without giving gold and cash to the boys' family. I don't want daughters. Even if I spend Rs 5,000 for abortion; it is better than spending Rs 500,000 on dowry[8].

Another study done by Saroja Krishnaswamy in Dharward city contradicts the present study where the majority of married group of respondents were found to have significantly more favourable attitude towards dowry than unmarried women. In addition, as the educational level increased the attitude of women became increasingly favourable toward dowry. Moreover as the income of their parents increased, the attitude of both married and unmarried women became increasingly favourable. These findings imply the need to search for social and psychological factors which defeat all the efforts to eradicate dowry[9].

Table 5. The consequences of the female feticide as stated by the nursing personnel and ASHAs

n=16

Sl.No	Suggestions	f	%
1	Men won't find wives	09	56.25
2	Sexual violence and crimes will increase	09	56.25
3	Normal existence of the community will affect	03	18.75
4	Man cannot carry the name of the family without woman	02	12.5
5	Women go back to their own houses	01	6.25
6	No respect to woman	01	6.25
7	Family members torture the women	01	6.25

Among the participants, 56.25% (9) of them cited two main consequences: Man cannot find wives and sexual violence and crimes will increase. Today, generally the women in the society are so much anxious about the sex of the baby, in spite of the parity of the mother. It is clear from the following statement of an ASHA worker.

If there are 2 boys also, some couples wish third baby also to be a boy. Five days before, I met one antenatal mother with third pregnancy. She is scared about the sex of the baby and she took *Halthi* powder and some Ayurvedic medicine. But it was not get aborted and now the pregnancy is going on.

The data regarding the multitude of reasons given by the respondents which they feel would help in dealing with this social issue are as follows: Among the 16 participants, 14 (87.5%) expressed the need for providing awareness to women. 9 (56.25%) of them added the importance of education to women to deal with the present situation which is evident in the following verbatim*:* "Actually, boys are not studying well and they are failing in most of the subjects; girls are doing well. I feel girls are more capable than boys."

With regard to the role of Doctors for preventing the female feticide, 87.5% of the participants opined that doctors should stop the detection of the sex of the baby. The role of doctors was expressed by an ASHA worker in one sentence: "Doctors are the main people who do the ultrasound scanning, doing the abortion and taking the money. So first, doctors should get awareness about the seriousness of the problem." Similar findings were reported in a study conducted in Delhi to assess the knowledge and the attitude of medical students and interns about female feticide. The participants included 62 interns and 39 IV year MBBS students and the data collected regarding the suggestions pertaining to arrest the declining gender ratio include: stricter punishment for doctors conducting illegal medical termination of pregnancy (15%), stricter punishment for doctors conducting illegal ultrasounds (26%), stricter punishment for a woman seeking abortions (14%) and stricter punishment for such a woman's family (56%)[10].

In the present study, according to 43.75% of the participants the regular follow up of pregnant mothers in the village is considered as one of the important roles of the ASHA workers. And 43.75% suggested the nurses should organize the training programme with movies to sensitize the people. Another study conducted in Ludhiana to assess the awareness and perceptions of school children regarding female feticide posed an open ended question in the questionnaire: "How this social evil can be stopped?" The respondents suggested the following answers: by increasing awareness in the society and parents, by giving equal status to girls, by giving punishment to people and doctors involved, by enforcing strict law and by enforcing law against prenatal sex determination[11].

Have you come across any woman with history of female feticide?

The responses were as follows: Yes

I have come across about 15-20 cases during my seven years of experience. After the registration of pregnancy, when the woman is not coming for check up, I enquire about it and then I come to know the reality.

One ASHA worker explained:"In most of the cases, the reason was that it was second pregnancy with a girl baby and they wanted a boy baby." Other two instances which the ASHA worker related are like this:

One woman registered for the second pregnancy; first child is a girl baby; when I went to her house to inform about vaccination, she is not pregnant. I asked

her what happened. While she was doing some work, she slipped off and baby got aborted. Mother said. Later I came to know that it was lie; actually she had done female feticide.

Last year, I met one lady who was pregnant for the third time and has two girls already. And she was confused and was scared about the sex of the third baby and wanted to do abortion without doing scanning itself. I discouraged her saying that what surety she has about the sex of the baby. Anyway, she continued her pregnancy and it was a boy baby.

Another ASHA worker shared her experiences:

One lady, pregnant for the fourth time; already three girls; her husband wanted to do scanning and abortion; Doctor informed them that it's a girl baby; by the time five months were over. She shared her experience with me. I said: If you kill this baby, how can you be happy in life? You also will have complications, even death; anyway she continued her pregnancy and gave birth to the fourth girl child.

In my village, I know one pregnant lady; I requested her to come for Inj.T T, but she did not come; when I enquired, I came to know that she has aborted her child. After that she has never become pregnant, even though she wanted a child.

Conclusion

Qualitative analysis of the nursing personnel and ASHAs regarding their perception about female feticide reveals that they are sensitized about this pressing issue and are ready to become the channel of communication to the public for the prevention of the female feticide. It is very necessary that the government and NGOs should systematically organize and orient several programmes to tackle this critical social issue.

Ethical Clearance: Formal permission was collected from State Appropriate Authority-cum-Director General, Health services, Haryana. Formal permission has also been collected from District Appropriate Authority (PNDT) –cum-Civil Surgeon, Faridabad. The data was collected after obtaining ethical clearance from the institutional ethical committee of St.James College of Nursing, Chalakudy. Written informed consent was obtained from all the participants before data collection and was assured that the information obtained would be kept confidential and used only for the research purpose.

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Risk Factors of the Occurrence of Diarrhea in Children Under Five Years Old In Indonesia (Riskesdas 2013 and 2018 Data Analysis)

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Abstract

Diarrhea is one of the main causes of under-five mortality in the world, including Indonesia. Indonesia's Infant Mortality Rate is 32 per 1000 births with diarrhea as the largest contributor at the age of 12-59 months. This study aims to identify the risk factors of diarrhea in children under five in Indonesia. The research design was a cross-sectional study using secondary data from Riskesdas 2013 and 2018. The sample is 176,275 toddlers. Bivariate and multivariate analysis used STATA. The final model of multivariate analysis showed that the risk factors were male (AOR=1.12, 95%CI=1.06-1.17) in 2013; (AOR=1.12, 95%CI=1.07-1.17) in 2018, poor nutritional status (AOR=1.27, 95%CI=1.18-1.36) in 2013; (AOR=1.18, 95%CI=1.05-1.33) in 2018, maternal age:10-24 years old (AOR=1.19, 95%CI=1.14-1.23) in 2013; (AOR= 1.19, 95%CI=1.14-1.23) in 2018, maternal education level:graduated from elementary school/equivalent (AOR=1.21, 95%CI=1.16-1.27) in 2013; (AOR=1.21, 95%CI=1.17-1.26) in 2018, mother's hand washing without soap (AOR= 1.21, 95%CI=1.15-1.28) in 2013; (AOR=1.12, 95%CI=1.07-1.18) in 2018, did not use a latrine (AOR=1.25, 95%CI=1.17-1.33) in 2013; (AOR=1.24, 95%CI=1.16-1.33) in 2018. It can be concluded that the risk factors of diarrhea in children under five were gender, nutritional status, mother's education, mother's age, mother's hand washing method and use of latrines.

Keywords: Diarrhea, Children, Risk Faktor, Riskesdas, Indonesia

Introduction

Diarrhea is one of the main causes of under-five mortality besides Acute Respiratory Infection (ARI).

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There are around 1.7 billion cases of diarrhea in children under five globally and about half million children under five die from diarrhea every year[1]. Indonesia is in the top 15 countries by contributing 70% of under-five deaths due to ARI and diarrhea[2]. In addition to causing death, diarrheal disease is also a cause of morbidity problems such as stunting[3].

There are some factors related to the occurrence of diarrhea in children under five such as the environmental factors (water sources, waste management, use of latrines), maternal factors (age, and education) and

biological factors (birth weight and nutritional status) [4]. Bartram and Cairncross (2010)[5] reported that the intervention carried out by washing hands with soap could reduce the risk of diarrhea by 48%. In addition, the improvement of water quality can reduce the risk of diarrhea by 17% and the use of healthy latrines can also degrade the risk of diarrhea by 36%. Since 2014 the WASH (Water Sanitation and Hygiene) program has been implemented in Indonesia, which is improving drinking water and proper sanitation services, but until now the occurrence of diarrhea in Indonesia is still high. Therefore, a national analysis is needed on spatiotemporal patterns and risk factors that influence the occurrence of diarrhea in children under five from 2013-2018 in Indonesia.

Materials and Method

This research is an observational study with a cross sectional design. This study used a Secondary Data Analysis (ADS) approach, by utilizing 2 secondary data sets as the main data source, which are Basic Health Research (Riskesdas) 2013 and 2018. Riskesdas 2013 and 2018 are carried out throughout Indonesia by the Health Research and Development Agency (Litbangkes) by Indonesian Ministry of Health. The implementation of the 2013 Riskesdas data collection was carried out in May-June 2013, in 33 provinces and 497 districts/cities while in 2018 it took place on March 2018 in 34 provinces and 416 districts/cities in Indonesia[6].

The population in Riskesdas is all children under five in Indonesia. The sample of this research was toddlers (0-59 months) which were based on the Susenas sample frame. There were 82,666 toddlers at Riskesdas 2013 and 93,609 toddlers at Riskesdas 2018. Toddlers with diarrhea excrete more liquid stools when defecating (BAB) with a frequency of > 3 times a day,

except in neonates (infants < 1 month) who usually defecate more frequently (5-6 times a day) with good consistency which is considered normal[7]. The next stage is a factor analysis using the STATA program. Univariate analysis used the frequency distribution of survey data analysis, while bivariate analysis used Chi square test and multivariate analysis used logistic regression test. If there is a missing value, then the data is not included in the data analysis.

The number of samples of children under five (0-59 months) used in the bivariate and multivariate analysis were 60,879 (2013) and 60,891 (2018). The risk factors that will be studied include the gender of the toddler, the age of the toddler, the nutritional status, the immunization status, the maternal age, thematernal education, the source of clean water, access to drinking water, waste management, the latrines usage and the behavior of washing hands.

Results

The distribution of demographic characteristics of children under five in Indonesia in 2013 and 2018 based on table 1 which is the number of children under five 0-59 months who became respondents in this study were 82,666 (2013) and 93,609 (2018). The proportion of men was higher than women in the two data collection periods which are 51.1% (2013) and 51.9% (2018). The proportion of children aged 0-11 months is 17.9% (2013) and 21.1% (2018). In addition, the proportion of maternal education is higher at the level of education graduating from junior high school/high school by 48.2% (2013) and 51.6% (2018), while maternal age at 25-34 years has the highest proportion both in 2013 (51.6 %) and in 2018 (49.4%). The proportion of diarrhea in children under five increased from 11.7% in 2013 to 12.3% in 2018.

Table 1. Distribution of Demographic Characteristics of Toddlers in Indonesia

Based on Riskesdas Data in 2013 and 2018

Variable	2013		2018	
	Sample (n=82.666)		Sample (n=93.609)	
	n	**%**	**n**	**%**
Gender				
Male	42.227	51,1	48.552	51,9
Female	40.439	48,9	45.057	48,1
Age (month)				
0-11	14.780	17,9	19.745	21,1
12-59	67.886	82,1	73.864	78,9
Maternal Education				
Level 1 (Elementary School)	31.027	37,5	27.924	29,8
Level 2 (High School)	39.872	48,2	48.313	51,6
Level 3 (College)	7.636	9,24	12.319	13,2
Missing	4.131	5	5.053	5,4
Maternal Age				
12-24 Years Old	11.598	14	14.699	15,7
25-34 Years Old	42.661	51,6	46.241	49,4
$\geq$ 35 Years Old	24.276	29,4	27.616	29,5
Missing	4.131	5	5.053	5,4
Toddler Diarrhea				
Diarrhea	9.681	11,7	11.498	12,3
Normal	72.985	88,3	82.111	87,7

Variables related to the occurrence of diarrhea in children under five in 2013 at p-value < 0.05 were gender, nutritional status, maternal education, maternal age, mother's hand washing, use of latrines, waste handling, and access to clean water, while in 2018 the variables associated with the occurrence of diarrhea in children under five were gender, age, nutritional status, immunization status, maternal age, maternal education, mother's hand washing, latrines usage, waste management, and drinking water sources.

Table 2. Distribution of Toddler Diarrhea in Indonesia in 2013 and 2018

Variable	2013 (n=60879)		2018(n=60891)	
	Diarrhea		Diarrhea	
	n	%	n	%
Gender				
Male	3,591	11.60	4,126	13.12
Female	3,143	10.51	3,479	11.82
Age (month)				
0-11	1,109	10.11	1,296	10.83
12-59	5,625	11.27	6,309	12.90
Nutrition Status				
Malnutrition	423	12.13	367	14.15
Poor Nutrition	1,158	13.20	1,241	14.02
Good Nutrition	4,899	10.66	5,801	12.18
More Nutrition	254	9.61	196	10.70
Immunization Status				
Incomplete	2,058	11.65	2,726	13.64
Complete	4,676	10.82	4,879	11.93
Maternal Age				
10-24 years old	1,199	13.78	1,477	15.41
25-34 years old	3,641	10.93	3,963	12.19
≥35 years old	1,894	10.03	2,165	11.52
Maternal Education				
Level 1 (Elementary School)	2,969	12.84	2,613	14.41
Level 2 (High School)	3,299	10.36	4,228	12.33
Level 3 (College)	466	7.88	764	9.02
Mother's Hands Washing				
Without soap	4,202	12.07	2,912	13.58
With soap	2,532	9.71	4,693	11.90
Latrine Usage				
No	1,604	14.26	1,311	15.92
Yes	5,130	10.34	6,294	11.95

Cont... **Table 2. Distribution of Toddler Diarrhea in Indonesia in 2013 and 2018**

Waste Management				
Bad	6,366	11.24	7,215	12.62
Good	368	8.68	390	10.53
Clean Water Access				
Non improved	2,707	11.75	4,230	12.26
Improved	4,027	10.64	3,375	12.79
Drinking Water Sources				
Non improved	2,997	11.18	1,573	13.76
Improved	3,737	10.97	6,032	12.20
Region				
Sumatera	2,696	10.59	3,610	12.47
Java-Bali	2,692	11.55	3,276	12.19
Kalimantan	737	8.91	1,095	11.66
Sulawesi	1,426	12.64	1,627	12.34
Nusa Tenggara, Maluku, Papua	2,130	14.85	1,890	12.42

Table 3. The Final Model of Multivariate Analysis of Risk Factors for the Occurrence of Toddler Diarrhea in Indonesia 2013 and 2018

Variable	2013 (n=60879)				2018 (n=60891)			
	Unadjusted OR OR (95%CI)	p	Adjusted OR (95%CI)	p	Unadjusted OR OR (95%CI)	p	Adjusted OR OR (95%CI)	p
Gender								
Male	1.12(1.04-1.21)	0.001*	1.12(1.06-1.17)	0.000*	1.11(1.03-1.19)	0.003*	1.12(1.07-1.17)	0.003*
Female	1		1		1		1	
Age (month)								
0-11	0.94(0.85-1.04)	0.273	0.87(0.81-0.93)	0.103	0.80(0.73-0.88)	0.000*	0.78(0.73-0.84)	0.000*
12-59	1		1		1		1	
Nutrition Status								
Malnutrition	1.14 (1.03-1,26)	0.006*	1.08 (1.04-1.13)	0.000*	1.17(1.05-1.30)	0.003*	1.18 (1.05-133)	0.005*

***Cont...* Table 3. The Final Model of Multivariate Analysis of Risk Factors for the Occurrence of Toddler Diarrhea in Indonesia 2013 and 2018**

Poor Nutrition	1.22 (1.15-1.29)	0.000*	1.27(1.18-1.36)	0.000*	1.14(1.08-1.20)	0.001*	1.17 (1.09-1.25)	0.000*
Good Nutrition	1		1		1		1	
More Nutrition	0.89 (0.79-1.01)	0.089	0.89 (0.77-1.02)	0.09	0.86(0.75-1.00)	0.056	0.86 (0.74-1.00)	0.056
Immunization Status								
Incomplete	1.05(0.96-1.15)	0.212	-	-	1.17(1.08-1.26)	0.000*	1.13(1.08-1.19)	0.001*
Complete	1				1		1	
Maternal Age								
10-24 years old	1.26 (1.20-1.32)	0.000*	1.19(1.14-1.23)	0.000*	1.23 (1.18-1.29)	0.000*	1.19(1.14-1.23)	0.000*
25-34 years old	1.03(1.01-1.05)	0.001*	1.03 (1.01-1.05)	0.001*	1.02(1.00-1.04)	0.024*	1.06 (1.00-1.12)	0.024*
≥35 years old	1		1		1		1	

continue

Variable	2013 (n=60879)				2018 (n=60891)			
	Unadjusted OR OR (95%CI)	p	Adjusted OR (95%CI)	p	Unadjusted OR OR (95%CI)	p	Adjusted OR OR (95%CI)	p
Maternal Education								
Level 1 (Elementary)	1.09 (1.08-1.11)	0.000*	1.21(1.16-1.27)	0.000*	1.15 (1.13-1.18)	0.000*	1.21(1.17-1.26)	0.000*
Level 2 (High School)	1.04 (1.03-1.05)	0.000*	1.09 (1.08-1.11)	0.000*	1.06 (1.05-1.07)	0.000*	1.41 (1.30-1.54)	0.000*
Level 3 (College)	1		1		1		1	
Mother's Hands Washing								
With soap	1.27(1.17-1.38)	0.000*	1.21(1.15-1.28)	0.000*	1.18(1.105-1.22)	0.000*	1.12(1.07-1.18)	0.000*
Without soap	1		1		1		1	
Latrine Usage								
Without latrine	1.33(1.21-1.47)	0.000*	1.25 (1.17-1.33)	0.001*	1.39(1.26-1.53)	0.000*	1.24(1.16-1.33)	0.000*
With latrine	1		1		1		1	
Waste Management								

***Cont...* Table 3. The Final Model of Multivariate Analysis of Risk Factors for the Occurrence of Toddler Diarrhea in Indonesia 2013 and 2018**

Bad	1.26(1.07-1.50)	0.000*	1.15(1.03-1,29)	0.011	1.20(1.02-1.41)	0.000*	-	-
Good	1		1		1			
Clean Water Access								
Non improved	1.14(1.04-1.24)	0.002*	-	-	0.95(0.88-1.02)	0.219	-	-
Improved	1				1			
Drinking Water Access								
Non improved	1.08(0.99-1.17)	0.052	1.05(1.00-1.11)	0.004*	1.17(1.07-1.28)	0.000*	-	-
Improved	1		1		1			

Logistic regression analysis of the factors associated with the incidence of diarrhea is shown in table 3. The final model of the multivariate analysis shows the variables that are risk factors for the incidence of diarrhea in children under five in 2013 are male (AOR=1.12, 95% CI=1.06-1.17), poor nutritional status (AOR=1.27, 95% CI=1.18-1.36), maternal age 10-24 years (AOR=1.19, 95% CI=1.14-1.23), maternal education level graduated from elementary school/equivalent (AOR= 1.21, 95% CI=1.16-1.27), washing mother's hands without soap (AOR=1.21, 95% CI=1.15-1.28), not using latrines (AOR=1.25, 95% CI=1.17-1.33, poor waste management (AOR=1.15, 95% CI=1.03-1.29) and inadequate drinking water sources (AOR=1.05, 95% CI=1.00-1.11). Variables that are risk factors for the occurrence of diarrhea in toddlers in 2018 were male (AOR = 1.12, 95% CI = 1.07-1.17), poor nutritional status (AOR = 1.18, 95% CI = 1.05-1.33), immunization status (AOR=1.13, 95% CI=1.08-1.19) maternal age 10-24 years (AOR=1.19, 95% CI=1.14-1.23), maternal education level graduated from elementary school/equivalent (AOR=1.21, 95% CI= 1.17-1.26), mother's hands washing without soap (AOR=1.12, 95% CI=1.07-1.18) and not using a latrine (AOR=1.24, 95% CI=1.16-1.33)

Discussion

The results of the analysis found that diarrhea was experienced more in boys in both 2013 and 2018 (table 2). Statistical tests show that there is a relationship between the gender of the child and the occurrence of diarrhea in children under five in Indonesia. Boys under five are 1.12 times more likely to have diarrhea than girls. This study is in line with research conducted by Sarker et al., (2016)[8] which stated that there was a relationship between gender and age of toddlers with the occurrence of diarrhea. It happens because male children are more active in playing outside the home, so they are more easily exposed to diarrhea-causing agents such as E. coli bacteria. The incidence of various types of diseases generally differs between the sexes[9].

The proportion of children under five with diarrhea aged 0-11 months was 10% and 11% in 2013 and 2018. The results of the 2018 statistical test showed that there was a relationship between age and the occurrence of diarrhea in children under

five. The natural immunity of children under one year has not yet been formed. This pattern illustrates the combination of decreasing maternal antibody effect levels, the lack of active immunity of the baby, the introduction of food that may be contaminated with fecal bacteria and direct contact with human or animal feces when the baby begins to crawl[10]. This study is in line with research by Sari, (2017)[11] which shows that there is a relationship between age and the occurrence of diarrhea in toddlers. This result showed that age was a protective factor in the occurrence of diarrhea in toddlers in 2013 and 2018, so the younger of the toddler are, the lower the risk of developing diarrhea. This happens due to the parenting pattern of the mother who is still very strict on her baby. The increased risk of age in toddlers is also influenced by several factors such as biological, socio-cultural and environmental factors [12],[4].

Malnutrition can reduce the immune system, defense and interfere with the immune function of toddlers. Similarly, complete basic immunization is needed to increase immunity to avoid various diseases including diarrhea. This study found that there was a relationship between nutritional status and immunization status with the incidence of diarrhea in children under five. Toddlers with poor nutritional status have a risk of 1.17-1.22 times for diarrhea. These results are in line with the research results of Rosari (2013)[13]; Dewi (2017)[14]which states that there is a relationship between nutritional status and immunization status with the occurrence of diarrhea in children under five. In addition, this study found risk factors changing for immunization status in 2013 was not a risk factor but in 2018 became one of the risk factors for diarrhea in toddlers. This happens due to an increase in the number of incomplete immunizations from 2013 to 2018. The Ministry of Health report also shows an increase in incomplete immunization status from 11.65% to 13.64% in 2018[15].

Other factors related to the occurrence of diarrhea in children under five are the maternal age, maternal education and how to wash her hands. This study found that toddlers who have diarrhea are more likely to have 10-24 years-mother and have an education that has completed elementary school/equivalent, also by washing their hands without soap. The result of statistical analysis showed that there is a relationship between maternal age, maternal education and how to wash her hands with the occurrence of diarrhea in children under five in Indonesia in 2013 and 2018. Diarrhea is often associated with mothers of children under five. Younger mothers have a greater likelihood of giving birth with less weight, as well as the lack of experience of mothers in caring for and feeding their children properly so that it is associated with the occurrence of childhood diseases including diarrhea[4]. Other studies have shown that a higher level of maternal education is associated with a lower occurrence of childhood diarrhea (AOR: 0.187; 95% CI, 0.609-0.573)[16]. Furthermore Watson et al., (2015)[17] it showed that the risk of children with diarrhea was 4.72 times if mothers washed their hands without soap.

This study shows that there is a relationship between the latrine usage, waste management, and drinking water sources with the occurrence of diarrhea in children under five in Indonesia. Stool disposal sites that are not in line with sanitation requirements will increase the risk of diarrhea in children under-five compared to families who have a habit of disposing of their feces that meet sanitation requirements[18]. Several factors increase the risk of toddlers experiencing diarrhea such as environmental factors which include waste management and water sources. These results are in line with the research conducted by Yaya et al. (2018)[19]stated that the lack of use of latrines and proper water facilities were associated with 14% and 16% higher incidence of diarrhea, respectively, compared to those with better

access.

The clean water source factor is not a factor for diarrhea in toddlers in 2013 and 2018. BPS noted that in 2019 there were at least 88.2% of families both in urban and rural areas who had access to safe water used for both main drinking water and bathing/washing water [8]. This study also found that the risk factors for handling waste and access to drinking water in 2018 were no longer a risk factor for the incidence of diarrhea due to the percentage of households with access to proper drinking water in 2018 of 73.65%. In addition, good waste management also shows an increase from year to year as evidenced by the number of villages that implement Community Based Total Sanitation (STBM) that have met the strategic plan target in 2019[15].

There are several variables in the Riskesdas survey that are not included in the research variables because the data availability is only in one period of data collection so that comparative analysis cannot be carried out.

Conclusion

The logistic regression analysis shows that there are 6 variables that are risk factors for the incidence of diarrhea in toddlers which are gender, nutritional status, mother's education, mother's age, mother's hand washing, and use of latrines. In 2013 : male (AOR = 1.12, 95% CI = 1.06-1.17), poor nutritional status (AOR = 1.27, 95% CI = 1.18-1.36), maternal age 10-24 years (AOR = 1, 19, 95% CI = 1.14-1.23), mother's education level graduated from elementary school/equivalent (AOR = 1.21, 95% CI = 1.16-1.27), mother's hand washing without soap (AOR = 1.21, 95% CI = 1.15-1.28) and did not use latrines (AOR = 1.25, 95% CI = 1.17-1.33. In 2018: male (AOR = 1.12, 95% CI = 1.07-1.17), poor nutritional status (AOR = 1.18, 95% CI = 1.05-1.33), maternal age 10-24 years (AOR = 1.19, 95% CI = 1.14-1.23),

mother's education level graduated from elementary school/equivalent (AOR = 1.21, 95% CI = 1.17-1.26), mother's hand washing without soap (AOR = 1.12, 95% CI = 1.07-1.18) and not using the latrine (AOR = 1.24, 95% CI = 1.16-1.33).

Suggestion

Health promotion regarding to hand washing behavior in the community related to prevention and control of diarrhea needs to be improved, especially for mothers of toddlers aged 10-24 years with an elementary school education level/equivalent. In addition, it is necessary to increase the coverage of under-five immunizations and to strive to prevent diarrhea by taking into account the completeness of nutrition, good hygiene and sanitation.

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Ethical Clearance: This research obtained ethical clearance from Health Research Ethics Committee of Faculty of Public Health, Hasanuddin University. The data obtained from Litbangkes which is only used for research purposes.

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KAP Study Towardsinfection Prevention & Control among Staff of Small Hospitals in Churu District of Rajasthan, India

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Abstract

Background: Healthcare workers routinely interact with blood-borne microbes and different microorganisms and are at a risk of getting infection. These interactions may happen during surgeries, during clinical and nursing administrations, basic assessment or while taking care of hospital facility. Knowledge, Attitude & Practice (KAP) regarding infection prevention and control (IPC) may include hand hygiene, use of PPE, gloves, masks, face shields, use of sanitizers, bio-medical waste management for safe work environment in hospitals. With this backdrop a KAP study was conducted in small hospitals, having bed strength up to 50 beds, in Churu District of Rajasthan.

Methods: The study design is descriptive and cross-sectional and was conducted in 6 small hospitals (less than 50 beds) of Churu District. The study tool included scheduled Interview and questionnaire and was conducted in Feb. to June 2020. The sample size included 75 Healthcare Workers (doctors, nurses, and staff of hospitals). The sampling technique was multistage sampling.The percentage of correct answers were recorded. A score of less than 50% was considered poor, 50% to 70% as fair while 70% and above was considered good.

Conclusion: The information on the staff was discovered to be among reasonable and good i.e., in the range of 65-75%. The act of discarding waste material was less and was observed as 67%. It was seen that 87% of staff were hepatitis B inoculated.Regular training regarding infection prevention can increase the knowledge and standardised measure may be followed by healthcare workers and staff present in the hospitals.

Key words: *Knowledge, Attitude, Practice, Infection, Prevention, Hospital, Healthcare, Staff.*

Introduction

Infection prevention and control (IPC) in hospitals deals with measures adopted by healthcare personnel to prevent infections which is an also an important patient safety issue. The measures adopted help to protect healthcare staff from pathogenic, contagious microbes including resistant bacteria and viruses[1,2,3] .

Hospital infections may include blood-borne infections, lung and skin infections, which are all serious threat to hospital staff. IPC helps in protectinghospital staff, visitors, and patients againstinfections. It may involve hand hygiene, hand disinfection, use of PPE (gloves, face shields, masks, goggles), sharps safety, waste disposal etc[4].

The staff should avoid wearingwristwatches, rings, or bracelets as they increase viral or bacterial load on hands resulting into infections. Hand hygiene may be performed before handling equipment,

before and after care of patients, patient examination, procedures and examinations, handling catheters/needles, or before and after administering injections. Hand washing should be done firmly including palms, fingers, thumbs, and wrists, preferably using dispenser soap for 20-30 seconds. Ethanol basedhand disinfectants may also be used. Glovesmay be used to reduce transmission of viruses, bacteria and other microorganisms by hands[4,5].

Knowledge, attitudes and practice (KAP) regarding infection prevention precautions is very important in hospitals, as it prevents the healthcare staff from various infectious diseases.

Knowledge regarding IPC can be gained through trainings, readings, and is a mixture of comprehension, experience, and skill. Positive attitude results in thinking, empathising, and reacting that lead to practice of IPC measures. Thus knowledge, positive attitude and practice of IPC could be taken as three important elements which may save healthcare staff from life threatening infections[6,7,8].

In small hospitals, there may be chances that infection prevention and control practices are not followed properly leading to unsafe work environment. Hence, with this backdrop this study was conducted to assess the KAP regarding IPC among staff (doctors, nurses, other professionals) in small hospitals in Churu district of Rajasthan, India[9,10].

Materials and Methods

The study design is descriptive &cross-sectional and was carried in 6 small hospitals (less than 50 beds) in Churu, District of Rajasthan.The study tool included scheduled Interview and questionnaire and the duration of the study was between March to June 2020.

The sampling technique included first selecting the departments (wards, Operation theatres, outpatient departments, Labour room, Lab. etc.) and then selecting few units from those selected departments. The sample size included 75 Healthcare Workers which included doctors, nursing staff, paramedical staff and housekeeping staff.

The details of the questionnaire included elements on detail of hospital, age profile, years of experience, awareness about infection prevention and control (IPC), source of information regarding IPC, components of IPC like Hand Hygiene, use of PPE, Needle and sharp injury prevention, sterilization, bio-medical waste management, advantages of IPC and Hepatitis B vaccination.

Data was analysed, discrete variables were presented as frequencies, measures of central tendency and the knowledge score was determined based on percentage of correct answers. The score of less than 50% was considered poor, between 50–70% as fair and 70% and above was considered good.Due ethical considerations were taken in the study and anonymity was maintained for responses.

Results and Discussion

The respondent's socio demographic status like category, age, experience,was recorded. It included doctors (12%), Nursing Staff (35%), Paramedical Staff (29%) and housekeeping staff (24%). Majority of the staff was less than 40 years (84%), and less than 10 years of experience (79%).

Knowledge of staff about the Infection Precautions: The respondents were asked about awareness and sources of information regarding infection control practices. Majority (88%) were aware of Infection control precautions, except the housekeeping staff which were unaware of the same. The source of information of IPC was majorly from educational/instructive books & formal trainings (80%), apart from colleagues and other sources (20%).

Infection control precautions: The components may include hand hygiene, gloves, masks, sharps safety, use of disinfectants and wastedisposal.

These components help prevent medicalstaffinfections that can be transmitted from patient to medicalstaff, and vice versa. The knowledge about the components of infection control and prevention is shown in Figure 1.
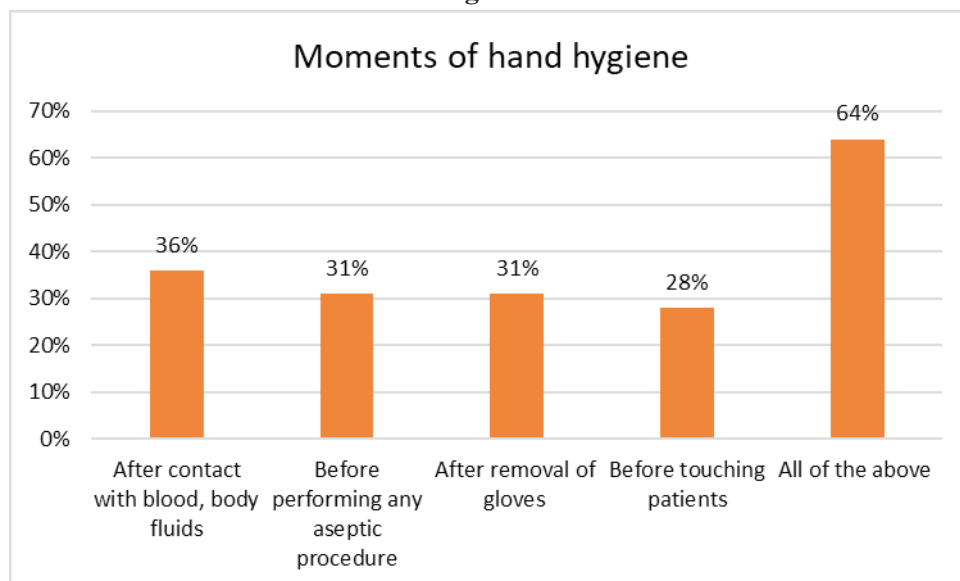
Figure 1
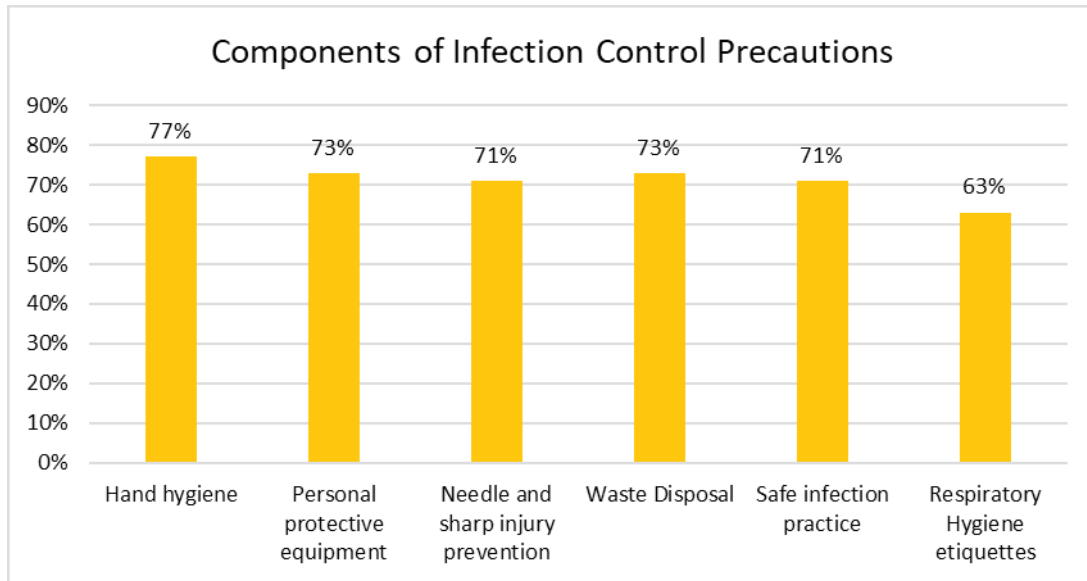
Advantages of IPC[11]: After data analysis, it was observed that that knowledge of the respondents regarding the advantages of infection control precautions was good (75%). The advantages included protection of healthcare workers and patients from various communicable diseases, and reducing hospital acquired infection.

Moments of health hygiene. When the participants were asked about the moments of hand hygiene, they gave the replies as below inFigure 2.

Figure 2

From the above figure, awareness of the moments of hand hygiene was low among healthcare staff.

Attitude of the staffregarding IPC: It was assessed to analyse the importance given by hospital staff towards Infection control precautions. It was assessed by asking the questions and the agreement/ disagreement with the statements. The percent outcome has been given inFigure 3.
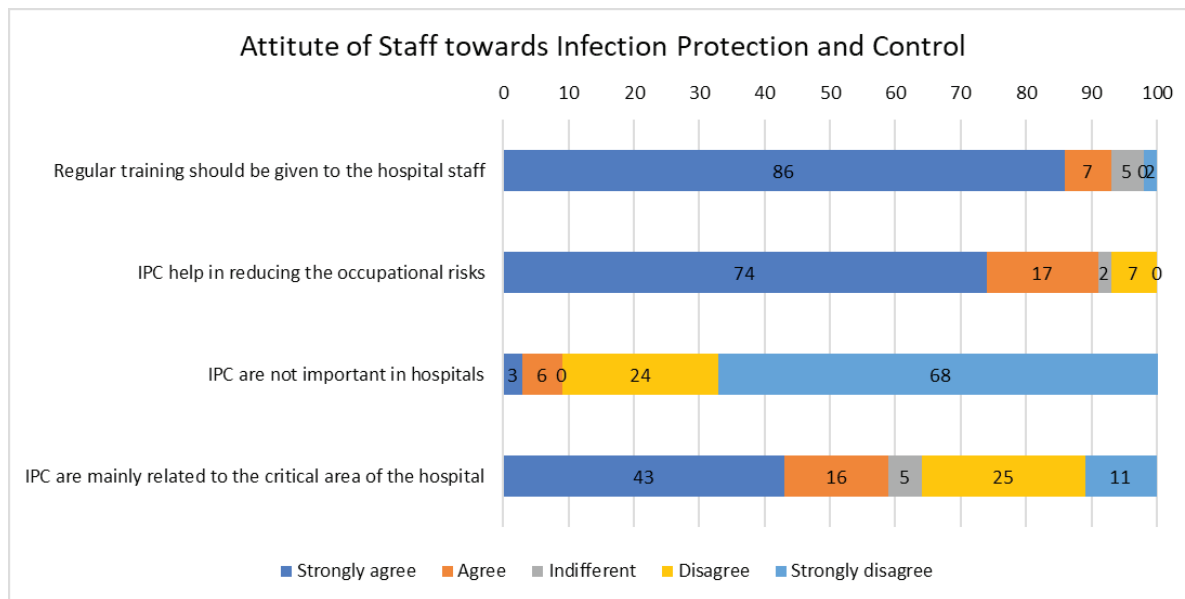
Figure 3

Interpretation: Most staff agree that regular training on IPC should be given in hospitals. The staff had positive attitude towards infection control preventive measures, and strong agreement that IPC helps in occupational risks associated with health workers.

Practice of the Infection control precautions[12, 13]

The practices of Infection control precautions among healthcare workers are shown in andFigure 4 and in Figure 5.
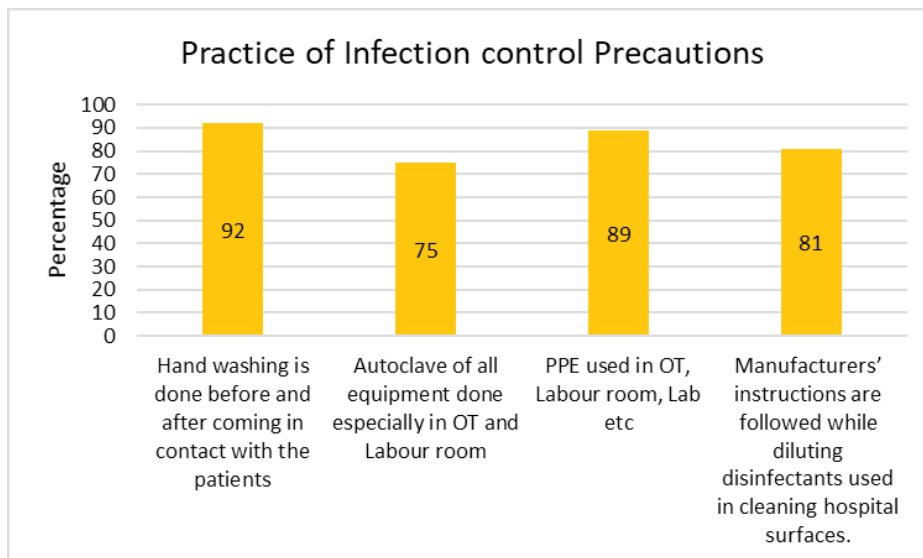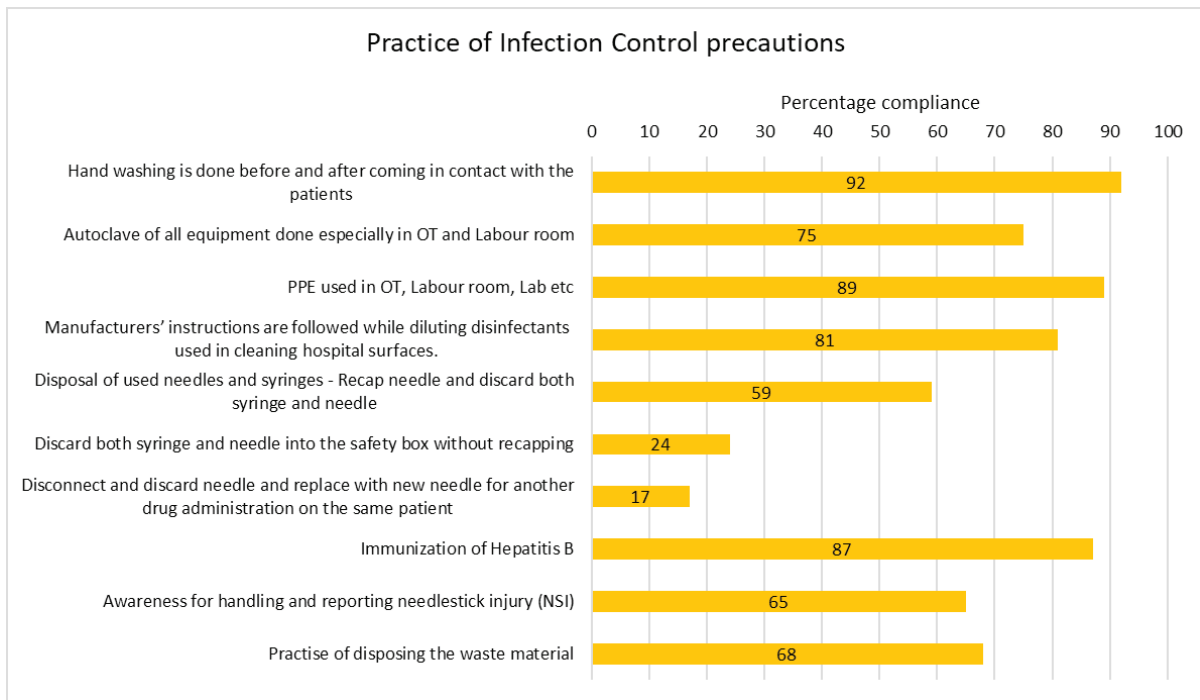
Figure 5

From the above figures it could be inferred that lower percentage of compliance was observed in disposal of used needles and syringes, which is very important in preventing healthcare associated infections among staff.

Conclusion& Recommendations

The knowledge of the staff in the hospitals was between fair to good, and there were aspects of IPC that the staff was not aware. A positive attitude towards infection control and prevention was observed. It may be recommended that hospital staff be trained regularly so that they can take infection control preventive measures in routine patient care. Approximately 87% of people are immunized against hepatitis. Specific training programs related to the improvement of the guidelines and hospital guidelines can be arranged in the hospital. The Hospital Infection Control Committee can address the guidelines followed by the hospital.

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Living Location nears Dam andGastrointestinal Helminth Infections in Rural Communities, Thailand: A Cross-sectional Study

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Abstract

Background: Gastrointestinal helminth infections (GHIs) are health problems worldwide. People with GHIs can develop gastrointestinal symptoms, general malaise and weakness, malnutrition, and impaired growth and physical development.This study was performed to determine the current prevalence of GHIs in epidemic areas in northeast Thailand.

Methodology: A cross-sectional survey was conducted between June 2020 and January 2021 in two districts (HuaiMek and Som Det) in Kalasin Province, Thailand. Stool samples were collected and processed using the formalin ethyl-acetate concentration technique to determine the presence of helminthic parasites. The odds ratio (OR) for GHIs was calculated according to the general characteristics.

Results: In total, 404 individuals were enrolled, and the overall prevalence of GHI was 8.91%. The species distribution included a majority of *Opisthorchis viverrini*infections (5.94%), followed by infections with *Strongyloidesstercoralis*(1.98%), *Taenia* spp. (0.50%), *Trichuris trichiura* (0.25%) and *Ascaris lumbricoides* (0.25%). Coinfections were identified in 4 cases with *O. viverrini* and *S. stercoralis* and 1 case with *O. viverrini* and *Taenia* spp. All infected participants had mild GHIs. The prevalence of helminthic infection was significantly higher in males ($P = 0.002$), in those aged >60 years old ($P = 0.025$), in those who were employed ($P = 0.004$) and in those who lived in the Som Det district ($P = 0.001$)than in their counterparts. Multivariable logistic regression analysis revealed that being male (adjusted odds ratio [aOR] 2.73, $P = 0.002$) and living in the Som Det district where nears dam(aOR1.73, $P<0.001$) were significantly associated with an increased likelihood of having aGHI.

Conclusion: This study demonstrated that GHIs, particularly in*O. viverrini*infections, are still prevalent in rural communities near large dams. The data from this study will be useful for guiding and improvingprevention and control strategies targeting*O. viverrini*and other helminths in this province.

Keywords: *Living Location. Dam. Gastrointestinal Helminth Infections. Thailand.*

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Introduction

Gastrointestinal helminth infections (GHIs) are health problems worldwide, and more than 1.7 billion people have GHIs, particularly in at least one of the five neglected tropical diseases[1]. It is estimated that 300 million people are infected with GHIs in ASEAN countries[2]. In Thailand, the national prevalence rate of GHIs was 18.1%, with a high prevalence rate of liver fluke infections[3]. Furthermore, data collected on the incidence of liver fluke infections in Thailand by the Ministry of Public Health showed that the percentage of Thai people infected with liver flukes was 8.7%. InKalasinProvince, in northeastern Thailand, 27.4% of the people were infected with liver flukes[4]. One type ofliver fluke, *Opisthorchis viverrini*, is associated with hepatobiliary tract diseases, including cholangiocarcinoma, which is a serious health problem in Thailand, especially in KalasinProvince[5,6]. In addition, a total of 22,338 patientsin a hospital-based study in northeast Thailand were tested for*Strongyloidesstercoralis,* and 17.4% tested positive for this helminth. In KalasinProvince, 21.1% had stool samples that tested positive for strongyloidiasis[7]. Meanwhile, 104 inhabitants of KalasinProvince were tested for GHIs, and the overall prevalence was 33.65%. The most common parasite was*S. stercoralis*(19.22%), followed by *O. viverrini*(5.76%) and *Taenia* spp. (0.96%)[8]. The data above indicate that KalasinProvince is an endemic area for GHIs, and more information is needed to definitely assess the current status of parasitic infections. People with GHIs can develop gastrointestinal symptoms, general malaise and weakness, malnutrition, and impaired growth and physical development[1]. Therefore, the current prevalence and burden of GHIs among residents at the district level need to be determined. These data may be useful for further prevention and control campaigns in the community.

Methodology

Study design and population: A cross-sectional survey was carried out from June 2020 to January 2021 and included people living in 12 rural villages located in the Sai Thong (5 villages)and Phi Moon (3 villages) subdistricts,HuaiMek district, and 4 rural villages located in the Som Det subdistrict, Som Det district, KalasinProvince, northeastern Thailand. The study area is located 517.4 km northeast of Bangkok and covers an area of 93 km^2 (Figure 1). Som Det and HuaiMekdistrictsare located near the Lam Pao dam (Som Det is closer than HuaiMek), the largest earthen dam in the country. It rises 33 meters above the water and can hold 1,430 million cubic meters. The dam was constructed to alleviate flooding and for agricultural purposes. The reservoir also serves as a breeding area for fish and a recreational destinationspot for the public. Participants were randomly selected from the villages in each subdistrict using a voluntary sampling method. A total of 404 volunteers were recruited from Sai Thong (n=219), Phi Moon (n=59) and Som Det (n=126). Data on sociodemographic characteristics were collected using a questionnaire. All participants provided written consent before submitting stool specimens and questionnaires.

Fecal collection and examination: Clean plastic containers were distributed to the participants at enrollment with detailed instructions about the procedure for collecting fecal specimens. All fecal samples were collected early in the morning and stored in iceboxes before being transported to the laboratory at the Parasitic Disease Research Center (PDRC), Institute of Medicine, Suranaree University of Technology.Each specimen was prepared and examined for the presence of gastrointestinal helminths with the formalin ethyl-acetate concentration technique[9]. Each specimen was examined under a microscope and initially screened under a 10× objective; the magnifications of the low-,

medium-, and high-power objectives were 4×, 10×, and 40×, respectively. Suspected gastrointestinal helminths were subsequently examined under a high-power objective. All samples were examined by two laboratory technologists from the PDRC. Patients who were infected with helminths and other known parasites were treated with anti-helminthic drugs and asked to attend health education sessions.

Statistical analysis: Statistical analyses were performed using the computer program STATA for Windows, version 13 (StataCorp LLC, Lakeway Drive, College Station, Texas, USA). The sociodemographic characteristics of the participants are presented as frequencies and percentages for categorical variables. The number of eggs per gram of feces (epg) was calculated as follows: (number of eggs/drop × total number of drops of fecal solution)/ (gram of feces). The intensity of infection was expressed as the epg for each participant. According to the WHO guidelines, the intensity of infection was classified as "light", "moderate" or "heavy" on the basis of the fecal egg count[10,11]. The differences in the categorical variables between the infected and uninfected groups were assessed using thechi-square test with the Yates correction. Multivariable logistic regression analysis was performed to estimate the odds ratios (ORs) and 95% confidence intervals (95% CIs) to assess the associations between potential risk factors and GHIs. A P-value <0.05 was considered statistically significant.

Results

Of the 404 fecal specimens examined, 31 were positive for at least one gastrointestinal helminth, resulting in an overall prevalence of 8.91%. The overall prevalence rate was 12.57% (22/175) in males and 3.93% (9/229) in females. Participants aged >60 years had a higher prevalence rate (15.15% [15/99]) than participants in the other age groups. Participants in the illiterate grouphad a higher prevalence rate (9.76% [4/40]) than participants with other levels of education. A high prevalence of GHIs was found in participants who were employed(20.00% [13/65]). When the participants were classified by location, those in theSom Det subdistrict had a higher prevalence rate (17.46% [22/126]) than participants in other subdistricts. The sociodemographic characteristics of the participants stratified by the presence or absence of GHIs were analyzed with the chi-square test; there were significant differences insex, age, employment status and location (Table 1). Five species of helminths were identified: 2 species were identified as foodborne helminths (FBHs), and 3 species were identified as soil-transmitted helminths (STHs). The most common FBHs were *O. viverrini*(5.94% [24/404]) and *Taenia spp.* (0.50% [2/404]), and the most common STHs were *S. stercoralis*(1.98% [2/242]), *T. trichiura*(**0.25%** [**1/**404]) and *A. lumbricoides*(**0.25%** [**1/**404])(Table 2). Of the 31 infected participants, all had light infections with *O. viverrini, S. stercoralis*, *Taenia* spp.,*A. lumbricoides*, and *T. trichiura* (Table 3). The associations of sociodemographic characteristics with GHIs were analyzed using multivariable logistic regression analysis (Table 3). The final model showed that being male (adjusted odds ratio [aOR] 0.273 [95% CI: 0.119-0.628], *P* = 0.002) and living in theSom Det subdistrict where nears the largest earthen dam (aOR 1.73 [95% CI: 1.292 – 2.315], *P*<0.001) were significantly associated with *O. viverrini*infection (Table 4).
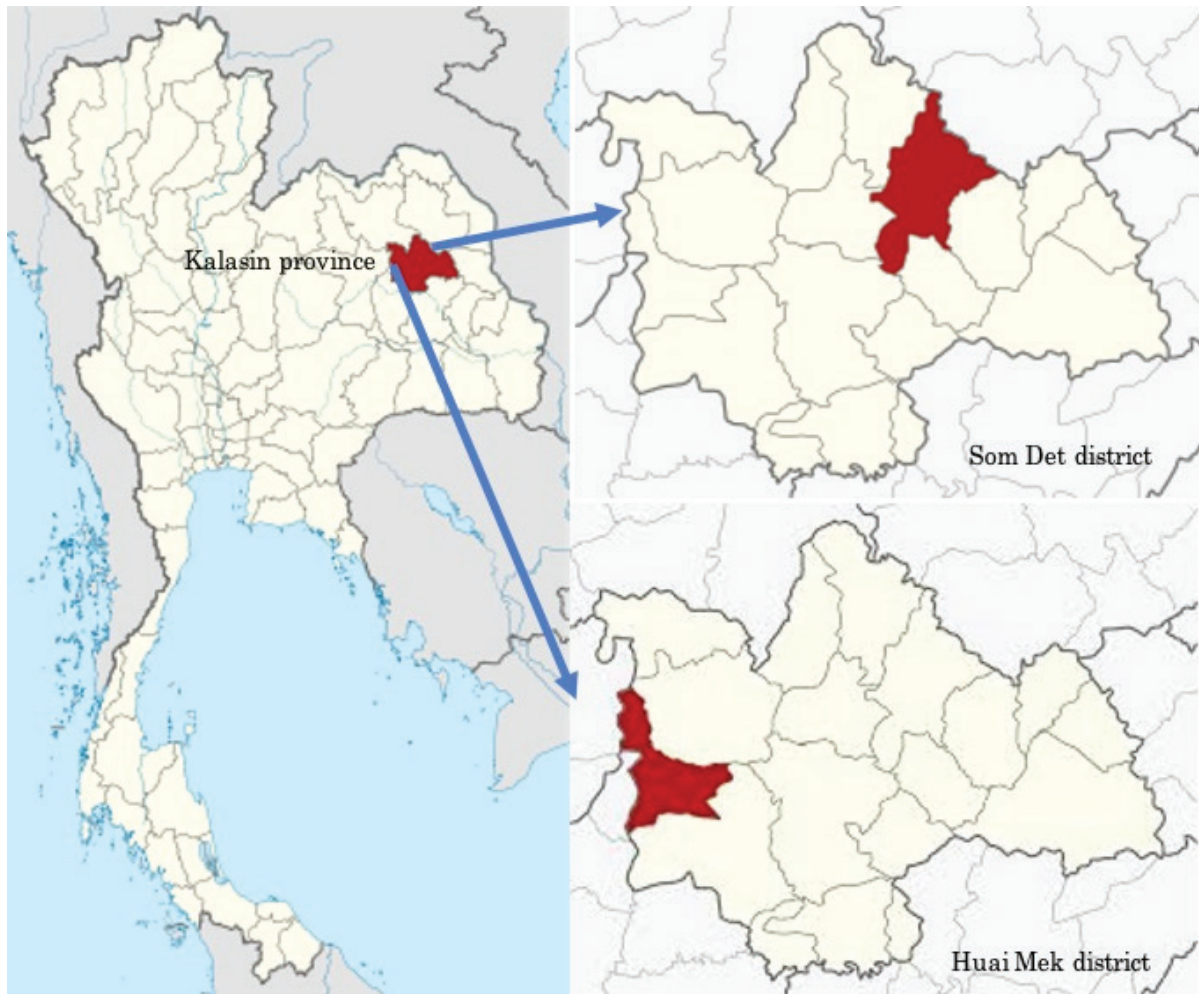
Figure 1.Map of Thailand showing the study area in Som Det and Huai Mek districts, Kalasin Province, Thailand.

Figure 2. Morphology of gastrointestinal helminth eggs and larvae identified by light microscopy in fecal samples. (A) *Opisthorchis viverrini* **egg (×400). (B)** *Trichuris trichiura* **egg (×400). (C)** *Taenia* **spp. (×100). (D)** *Ascaris lumbricoides* **egg (×400). (E)** *Strongyloides stercoralis* **larvae(×400).**

Table 1. Positivity for gastrointestinal helminth eggs stratified by general characteristics (n=404)

Variables	No. samples n(%)	No. positive n(%)	Infection rate (%)	P-value	Chi-square test
Sex					
Male	175(43.31)	22(12.57)	6.19	0.001*	10.455
Female	229(56.68)	9(3.93)	2.23		
Age (yr)					
≤20	6(1.48)	0	0		
21 – 30	7(1.73)	1(14.29)	0.25		
31 – 40	29(7.18)	3(10.34)	0.74	0.025	12.803
41 – 50	107(26.48)	4(3.74)	0.99		
51 – 60	156(38.61)	8(5.13)	1.98		
> 60	99(24.50)	15(15.15)	3.71		
Education					
Illiterate	40(9.90)	4(9.76)	0.25	0.841	1.416
Primary	260(64.37)	21(8.08)	5.20		
Secondary	92(22.77)	5(5.43)	1.24		
College	3(0.74)	0	0		
Other	9(2.23)	1(11.11)	0.25		
Employment status					
Employed	65(16.09)	13(20.00)	3.22	0.004*	17.092
Famer	249(61.63)	14(5.62)	3.47		
Shopkeeper	23(5.69)	0	0		
Housewife	25(6.19)	3(12.00)	0.74		
Government officer	5(1.24)	0	0		
Other	37(9.16)	1(2.70)	0.25		
Location (subdistrict)					
Sai Thong	219(0.74)	7(3.20)	1.73	0.001*	25.675
Phi Moon	59(14.60)	2(3.39)	0.50		
Som Det	126(31.19)	22(17.46)	5.45		
Data are presented as the frequencies (%). *Chi-square test					

Table 2. Gastrointestinal helminth infections among 404 rural villagers in Huai Mek and Som Det districts, Kalasin Province, northeastern Thailand

Type of gastrointestinal helminth	No. positive	Prevalence (%)
Opisthorchis viverrini	24	5.94
Strongyloides stercoralis	8	1.98
*Teania*spp.	2	0.50
Trichuris trichiura	1	025
Ascaris lumbicoides	1	0.25
Total	**36**	**8.91**

Table 3. Egg counts (eggs per gram of feces) used to describe the intensity of infection (n=404)

Type of gastrointestinal helminth	Intensity of infection (egg count per gram)	Level of intensity
Opisthorchis viverrini	180.12 (22-1564)	light
Strongyloides stercoralis	71.50 (12-252)	light
Teania spp.	225(184-266)	light
Trichuris trichiura	110	light
Ascaris lumbicoides	20	light

Table 4. Factors associated with gastrointestinal helminth infection in the multivariable logistic regression analysis

Variables	No. samples n(%)	No. positive n(%)	Infection rate (%)	*OR	95% CI	P-value	**ORadj	95% CI	P-value
Sex									
Male	175 (43.31)	22(12.57)	5.45	0.285	0.128-0.635	0.002*	0.273	0.119-0.628	0.002*
Female	229 (56.68)	9(3.93)	2.23						
Age (yr)									

Cont... **Table 4. Factors associated with gastrointestinal helminth infection in the multivariable logistic regression analysis**

Variables	No. samples n(%)	No. positive n(%)	Infection rate (%)	*OR	95% CI	P-value	**ORadj	95% CI	P-value
≤20	6(1.48)	0	0	1.47	0.978-2.209	0.064	1.363	0.895-2.076	0.149
21 – 30	7(1.73)	1(14.29)	0.25						
31 – 40	29(7.18)	3(10.34)	0.74						
41 – 50	107(26.48)	4(3.74)	0.99						
51 – 60	156(38.61)	8(5.13)	1.98						
> 60	99(24.50)	15(15.15)	3.71						
Education									
Illiterate	40(9.90)	4(9.76)	0.25	0.832	0.482-1.437	0.510	0.996	0.531-1.868	0.990
Primary	260(64.37)	21(8.08)	5.20						
Secondary	92(22.77)	5(5.43)	1.24						
College	3(0.74)	0	0						
Other	9(2.23)	1(11.11)	0.25						
Employment status									
Employed	65(16.09)	13(20.00)	3.22	0.737	0.509-1.066	0.105	0.731	0.52-1.028	0.072
Famer	249(61.63)	14(5.62)	3.47						
Shopkeeper	23(5.69)	0	0						
Housewife	25(6.19)	3(12.00)	0.74						
Government officer	5(1.24)	0	0						
Other	37(9.16)	1(2.70)	0.25						
Location (subdistrict)									
Sai Thong	219(0.74)	7(3.20)	1.73	1.735	1.300-2.315	0.000*	1.73	1.292-2.315	0.000*
Phi Moon	59(14.60)	2(3.40)	0.50						
Som Det	126(31.19)	22(17.46)	5.45						

*Crude odds ratio from univariate analysis, **Adjusted odds ratio for all other variables

Discussion

GHIs continue to be a major health problem in many countries. This is particularly true for FHBs and STHs, which have been recognized as important public health problems in developing countries[1,12],including Thailand, especially in rural areas where there remains a lack of hygiene and an inadequate supply of clean water[13,14]. In this study, our data showed that the overall prevalence of GHIs among the rural participants was 8.91%. Compared with the results reported inother studies in KalasinProvince (33.65%), this prevalence was lower[8]. This could be due in part to the implementation of active control programs for helminths by the Ministry of Public Health. Our study showed that the prevalence was higher in males than in females. The sex difference may be due to male-specific behavioral factors such as eating raw meat and working in agriculture[15,16].A greater proportion of men work in muddy rice fields without footwear, whereas a greater proportion of women work as housewives and wear shoes while walking around in their houses and villages[7,17]. In our study, the prevalence of GHIs in the older age group was higher than that in the younger age group. This result is similar tothose reported by previous studiesthat showed that older people need to undergo screening for GHIs and that interventions need to focus on this population[18,19]. This may be because older people still tend to have lower education levels, live in conditions with poor sanitation and have a culturally embedded habit of eating uncooked food[14, 20-21]. A relatively high prevalence was found in the participants who were illiterate. This is similar toprevious studies that found that people in the community with low level of education, especially farmers and other workers, have a relatively high prevalence of parasitic infections[12-14]. In particular, farmers may be at risk due to conditions in the field, and many men work in muddy rice fields without footwear[13,14,17]. Health education programs should target this group and teach them about the benefits of avoiding raw food wearing shoes. In this study, our data indicated that Som Det districthad a higher prevalence of GHIs than other districts. This may be due in part to the fact that thefarms where they work and the houses where they liveare located in the same area near a large freshwater dam, which increases the risk of infection. A previous study reported that GHIs were was associated withliving at lower elevations in KhonKaenProvince, northeastern Thailand. This study indicated that lower elevation was associated with a higher infection rate than higher elevations[14, 18]. Moreover, a previous study showed the prevalence of and risk factors for *O. viverrini* infection among cats and dogs in six districts surrounding the Ubolratana Dam. Cats and dogs can be infected by*O. viverrini* and may play an important role in the transmission and maintenance of this disease in areas around large dams[22]. In our study,we focused on humans, and there were infected individuals in all the villages. Therefore, more efforts from the local administration, particularly with regard tohealth education campaigns among the villagers, are needed to preventGHIs by improving sanitation; accomplishing this goal would improve the general health of the villagers. The most common FBHs were identified as *O. viverrini* and *Taenia spp.*, which is concerning because*O. viverrini* is a carcinogenic liver fluke that causes serious problems in Thailand. Our data showed that some participants were infected with*O. viverrini*, but the prevalence was lower than in previous studies. In Thailand, the Ministry of Public Health reported that the percentage of *O. viverrini* infectionsidentified during the period 2009 to 2013 was 8.7%. Yahom*et al.*[8] reported that the prevalence of*O. viverrini*infections in KalasinProvince was 5.76%.In KalasinProvince, 27.4% of people were infected with liver flukes[4]. These results indicate that *O. viverrini* is still affectingthe Thai population at the village level. Although this study found a relatively low prevalence and light intensity, these liver flukes

still exist and are widely distributed, with prevalence ratessimilar tothose in other areas. Coinfections identified, with 5 cases of *O. viverrini*, *S. stercoralis* and *Taenia* spp. coinfections.

The results of the present study aresimilar tothose of a previous study that found*S. stercoralis* and *O. viverrini* infections in rural communities in northeast Thailand. The prevalences of *S. stercoralis* and *O. viverrini* infections have not declined[15]. Active control programs for helminthsstill need to be implemented by the Ministry of Public Health. The most common STHs were *S. stercoralis*, *T. trichiura*and *A. lumbricoides*. This study showed that the most prevalent STH found in human feces was*S. stercoralis*, which isa common nematode in Thailand. The findings indicated*S. stercoralis* infections are more prevalent than infections with other types of STHs.Direct skin contacts with soil that results from walking around barefoot and poor sanitary standards are both risk factors for contracting these infections[7].*S. stercoralis* infections are more common in tropical and subtropical countries with hot and humid climates[23,24]. KalasinProvinceis located in the equatorial zone, and the average temperatures remain relatively high, even in the cooler and rainy seasons. The climate helps explain the high prevalence of infection in this area[7].Ribas*et al*.[25]reported gastrointestinal infections and environmental water contamination in a rural village in northern Lao's PDR. The level of microbial pathogen contamination was associated with the level of human activity, with greater levels of contamination found at the downstream site than at the village and upstream sites. Furthermore, the microbial population was detected in the local river, which was the natural source of the water consumed in the village. Adequate warmth and moisture are key environmental features promoting the survival of STHs and FBHs. Other common STHs were *T. trichiura*and *A. lumbricoides*. Therefore, preventive measures should be taken to protect people from contracting thesehelminthic infections.

Conclusion

In conclusion, our results show that GHIs withFBHs and STHs still occur in rural communities near large reservoirs. The data from this study will be useful for guiding and improving future prevention and control strategies with regard to infections with *O. viverrini*and other helminths in this province. Interventions should concentrate on the personal hygiene of the population and improvements in sanitation to reduce the prevalence of GHIs in this area.

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Study to Evaluate the Risk Factors of Overweight and Obesity among Higher Secondary School Children in Muzaffarpur, Bihar

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Abstract

Background: Overweight and obesity are risk factors for diet-related non-communicable diseases. These diseases are the fifth leading risks for global deaths. Virtually, all age groups are affected bythe consequences of overweight and obesity.

Aims and Objectives: This study was undertakento evaluate risk factors of overweight and obesity among higher secondary school adolescents.

Methodology: A cross-sectional study was conducted among 492 school adolescents of the government sector six higher secondary schools in Muzaffarpur. This study measured height, weight and plotted Body mass Index on CDC (Child Development Centre) charts. Factors affecting obesity like physical and sedentary activities (using Bharathy et al. questionnaire) and school-based risk factors were also studied.

Results: Based of measurements taken risk factors for overweight and obesity in 492 higher secondary school students, the estimated provincial prevalence of overweight was found to be 9.7%, obesity 3%, and malnutrition 18% respectively. Students involved in household chores for 4 hours or more a week were associated with a decreased risk of overweight (OR 3.97, 95% CI 1.41-11.03) and those with less activity were at increased risk for obesity (OR 6.59, 95% CI 1.83-21.19).

Conclusion: The problems of overweight and obesity are taking place while students are still at the risk of underweight. Several factors were correlated with overweight and obesity. Therefore, interventions targeting gender, frequency of eating food out of home, vigorous activities, and frequency of doing the vigorous physical activity are recommended.

Keywords: *Obesity, Body mass index (BMI), overweight, physical measurements*

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Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation, resulting in weakening the health of an individual [1-3]. The epidemic of overweight and obesity reflects the changes in society and behavioral patterns of communities over recent

decades. Even if genes are important in determining a person's susceptibility to weight gain, energy balance is also a factor for overweight and obesity. Societal changes and worldwide nutrition transition are driving the overweight/obesity epidemic [4, 5]. Adolescence is a vulnerable period for the development of obesity and the weight of adolescents' tracks strongly into adulthood [6]. Adolescent overweight and obesity are increasing globally, raising the threat of long-term illness in later adulthood [7,8]. Overweight and obesity are a result of an imbalance between energy intake and expenditure with an increase in energy balance being closely associated with the lifestyle adopted and the dietary intake preferences [9].

A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight. Overweight and obesity are major risk factors for several chronic diseases, including diabetes, cardiovascular diseases and cancer. Once considered a problem only in high-income countries, overweight and obesity are now dramatically on the rise in low and middle-income countries, particularly in urban settings. India has >135 million obese individuals at present. Body mass index (BMI) has been used to assess obesity until recent times. By the year 2020, there would be 158 million obese children in the world, 206 million by 2025 and the figure would reach 254 million by 2030. In fact, after China, India will have the most number of obese children at 27,481,141 or 27 million, far ahead of the US at 17 million [10].

Although the growing prevalence of overweight and obesity among secondary school children has received much attention in recent years there is not much data available, so the above study to evaluate risk factors of overweight and obesity among higher secondary school children in Muzaffarpur, Bihar. This evaluation was done to assess the risk factors associated with overweight and obesity among

secondary school children.

Materials & Methods

A cross-sectional study was conducted for during May, 2020 to May, 2021. The present study was conducted in randomly selected six higher secondary schools belonging to the Government sector situated in Muzaffarpur. Muzaffarpur is a city located in the Muzaffarpur district in the Tirhut region of the Indian state of Bihar. Children studying in classes XI and XII between the ages of 14 to 18years were included in the study. Informed consent was obtained from the Principal and Parents. Ethical committee approval was obtained. A sample size of 492 students from the government sector schools was included in the study. Baseline parameters like age, sex, and socio-economic status (SES) using Modified Kuppusamy Scale were noted. Height and weight were also recorded in all of them. The height was measured as a distance between the ground and a scale pressed firmly on the child's head and placed horizontally to the ground. Weight was recorded on a digital weighing scale after removing the footwear.

Body mass index (BMI) was calculated using the formula weight in Kg/height in m^2. Over-weight was defined as BMI between 85th and 95th centile according to age and gender specific charts by CDC (Child Development Centre). Obesity was defined as BMI more than 95th centile and under nutrition as BMI less than 5th centile according to the same charts. This value was used as a cut off for statistical analysis. [11] Students were also grouped according to Agarwal charts.[12]

A questionnaire prepared for finding out the 'prevalence and determinants of obesity in higher secondary school children' developed by CDC was given to these students. The questionnaire was filled by the students after a brief introduction by the investigator about how to fill the proforma. The

questionnaire is a structured one on the determinants of obesity. Socio economic status was assessed using Modified Kuppusamy scale. Physical activity was ascertained by asking about daily physical activity during a typical month in a proforma designed by Bharathy et al.[13] Any hobbies at home and house hold chores were also assessed. Secondary activities like reading, TV watching, hobbies were recorded.

Appropriate statistical tests (chi square) and logistic regression were carried out to find the association of variables. Univariate and multivariate analyses were conducted to determine the association between dependent (overweight) and independent (risk factors) variables. Initially, in univariate analysis, a single variable at a time was entered; unadjusted OR and 95% CI were computed for all independent variables. Multivariate analysis with all independent variables entered at the same time was completed to adjust for the effect of confounding, and adjusted OR and 95% CI were computed.

Results

Four ninety two school adolescent studying in the classes XI and XII from six higher secondary schools of the government sector were examined. Out of this 51.82% (255) were girls and 48.17% (237) were boys. Age group ranged from 14 to 18 years in the study population. In boys, height ranged from 157.5cm to 181cm, weight from 40.5 to 82 kg and BMI from 15.35 to 30.09. In girl's height ranged from 151.69 to157.5cm, weight from 48.15 to 50 kg and BMI from 19.33 to 20.79.

Table 1: Gender distribution of overweight andobesity

Sex	Over weight	Obese	%
Male	23	7	30/237 (12.65)
Female	13	10	23/255 (7.84%)
%	36/492 (7.31%)	17/492 (3.45%)	53/492

Out of 237 boys 72% were having normal nutritional status based on BMI, 18% were undernourished, 9.7% were overweight and 3% obese. Out of 255 female students 73% were having normal BMI, 18% were undernourished, 5% were overweight and 4% obese. Out of 17 obese students 59 % were girls. This gender difference was statistically significant (3.2%).

Table 2: NCHS and Agarwal classification of obesity

Category	NCHS	Agarwal
Underweight	84 (17 %)	54 (10.47 %)
Normal	358 (72 %)	391 (79.47 %)
Overweight	34 (7 %)	35 (7.11 %)
Obese	16 (4 %)	12 (2.43 %)

Fifty obese/overweight students were selected and physical activity questionnaire was given to them. Two students were not willing to fill the proforma and 4 proformas were incomplete and thus excluded.

So, a total of 44 obese or overweight children were compared with 52 randomly selected normal children with BMI less than 85th centile.

Table 3: Risk factors for obesity

Risk factors	Significance 95 % CI P value Odds ratio 95 % CI		
House hold chores	0.02	3.71	1.23 11.2
Sedentary (TV watching)	0.013	5.33	1.43 19.89

The data statistically significant with a p value of 0.02, oddsratio (OR) of 3.71 and 95% confidence interval (CI) of 1.23 to 11.2. Physical activities in the form of games and sports (less than 4 hours in a week) were observed in 75% of cases. Physical activities of more than 4 hours in a week were observed in 25% of cases. But this was not found to be statistically significant. Logistic regression and univariate analysis were also done.Multivariate analysis was done to rule out confounding factors which can affect the result. House hold factors and sedentary activities were found to be significant.

Discussion

According to the findings of this study the prevalence of overweight and obesity was 7.31 % and 3.45 %, respectively, resulting in the prevalence of overweight and obesity together, 10.76 %. This was found to be statistically significant. The difference may be due to the fact that the students mainly belong to affluent classes belonging to upper and middle SES. In India, there is a tremendous urban/rural and rich/poor divide. Prevalence among urban rich being much higher than rural and poor communities.Overweight and obesity among children is progressing towards epidemic level. Even relatively small increase in body weight, has its influence on cardio cerebral

morbidity and mortality. Till now in India the priority of pediatrics studies were focused on prevalence of Malnutrition.[14] Data from National Health survey has shown that approximately 30% children from US were overweight and obese which is greater than the prevalence in India (10%) as shown by IOTF (Indian Obesity Task Force). A similar study was showing the prevalence of overweight as 7.5% and obesity as 3% almost comparable to our study.[15] The prevalence of overweight (24.4%) and obesity (8.9%) was reported at age 15.[16]

In present study this difference was not apparent probably due to socio economic condition in Bihar where there is no much drastic difference between different SES groups unlike other states. In a review article SES has shown to have inverse relationship with obesity in developed countries, which is not consistent with men and children of the same society, but in developing countries it is showing a strong direct relationship which is well reflected in our study.

Conclusion

Obesity is increasing among school children and demands preventive strategies. This study is one of the few conducted in Muzaffarpur, Bihar that have analyzed risk factors associated with overweight and obesity among adolescent students and it also

compares the association of these risk factors with prevalence of obesity and overweight. Therefore, the government, the schools, and the families need to collaborate to improve the health of the students.

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Relation between Blood Lead Levels and Childhood Anemia

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Abstract

Background: Lead pollution is a major problem in developing countries. Childhood lead exposure is one of the most significant environmental health threats that affects children. In children, it is defined as a blood lead level equal to or greater than 10 μg/dl. Iron deficiency is a cause of hypochromic microcytic anemia, and also increases the absorption of elements like lead. Anemia in children leads to increased morbidity and mortality. This study was done to determine the relation of blood lead levels greater than 10 μg/dl with the anemia compared to levels less than 10 μg/dl.

Material and methods: The conduct prospective observational study was conducted on 100 children. For each children haemoglobin, MCV, RDW and blood lead level were tested. 50 children with proven anemia and equal number of children without anemia were enrolled in the study and was analysed and their blood lead levels were tested.

Results: Out of 100 children, 63 were male and 37 were female. The overall children mean age was 73.65 + 52.94 months, male mean age was 73.30 + 51.52 months & female mean age was 74.24 + 55.99 months. The Prevalence of Iron Deficiency Anemia by MCV is 64.2% and Prevalence of Iron Deficiency Anemia by RDW is 58.8%.

Conclusion: Prevalence of Iron Deficiency anemia by MCV and RDW was 64.2% and 58.8%. However there was a significant difference between the anemic and Non anemic group regarding MCV and RDW. According to the study, there is minimal lead exposure and no lead toxicity in this area.

***Keywords:** Lead, Iron deficiency Anemia, Hemoglobin, mean corpuscular volume, Red cell distribution width.*

Introduction

Anemia is a common phenomenon worldwide with a higher prevalence in developing countries. More than one fourth of the world's population suffers from anemia while iron deficiency anemia (IDA) accounts for half of such cases. It is mostly seen in preschool-aged children and women [1].

Lead pollution is a major problem in developing countries. Diet, air, drinking water and ingestion of paint chips are considered the primary sources of lead exposure in humans; with increased severity and frequency in developing countries through contaminated soil, water and air pollution. Lead poisoning leads to adverse interaction in cellular biochemical reactions, causing many organ malfunction [2].

Childhood lead exposure is one of the most significant environmental health threats that affect

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children. Blood lead level equal to or greater than 10 µg/dl [3], are being associated with adverse behavioral and developmental outcomes. Recently no level less than 10µg /dl is considered safe [4].

Human exposure to lead occurs primarily through diet, air, drinking water and ingestion of paint chips where absorption is increased mainly in persons suffering from iron and calcium deficiency [5].

Environmental lead exposure occurs from automobile exhaust in areas of the world where leaded gasoline is still being used. At home exposure among children may occur either because of ingestion of old leaded chips or because of pigments and glazes used in pottery [6].

Anemia leads to increased morbidity and mortality in children[7]. Adverse health effects of anemia in children include impaired psychomotor development and renal tubular function, poor cognitive performance and mental retardation [8,9].

This study was therefore done to investigate the association of blood lead level ≥ 10µg /dl and the higher risk of anemia of varying severity among children. The study was conducted to study the relation between blood lead leavel and childhood anemia.

Material And Methods

Study Population:

This study was carried out on a total of 100 children from the pediatric ward in Krishna Institute of Medical Sciences, Karad. They were selected by a systematic random sample. Exclusion criteria of cases were children having anemia due to blood disorder. Children were classified into two groups, anemic group (50 children) withHb levels < 11 g/dl and non anemic group (50 children) with Hb levels > 11 g/dl, aged 6 months to 14 years. Mothers of children were informed about the aim of the study

and their consent was obtained. Data related to age, gender, residence, source of drinking water, degree of father and mother's education and their occupation, According to the WHO definition of anemia based on hemoglobin level less than 11 g/dl, the studied population was divided into anemic and non anemic groups [10]. The anemic group was further classified into categories of mild (Hb level 10-10.9 g/dl), moderate (Hb level 8-9.9 g/dl) and severe (Hb level < 8 g/dl) anemia. Also, according to serum blood level, the studied population was classified into two groups, <10 µg/dl and ≥10 µg/dl.

Laboratory Investigations:

A venous blood sample was taken from each child and divided into three tubes. The first tube (containing EDTA) used for estimation of hematological parameters using Celtic auto-analyser, these parameters included the red blood cell count (RBC), hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), and red cell distribution width (RDW). The second tube (containing heparin) for estimation of lead by the atomic absorption spectrophotometer[11]. The third tube, Hitachi 911 auto-analyser was used for serum iron estimation using Roche reagent kits.

Statistical Analysis

Statistical analysis was done by SPSS statistical package Version 19 .Chi-square test was performed to compare individual characteristics and the t-test was performed to compare the haematological parameters between the two groups. P-value was considered statistically significant if <0.05. Pearson correlation test was used to determine the significant correlations between variables.

Results

In total 100 children were studied, 50 were anemic

and 50 were non anemic. The children mean age was 73.65 + 52.94 months (range: 6 months - 14 years); in total 63 (63%) children were male including 31 (49.2%) in the anemic group and 32 (50.8%) in the non anemic group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.836) [Table 1].

The frequency distribution of individual characteristics was studied among the anemic and non anemic group (table 1). There is no statistical significant difference was found for all individual characteristics but age is statistically significant among anemic and non anemic group. Also high prevalence of Educated Mothers (90.0%), Educated Fathers (96.0%) and those consuming Tap water (92.0%) among the anaemic and non anaemic group.

Table No.1: Frequency Distribution of Individual characteristics among the Anemic and Non Anemic group.

Variable / Group	Anemic (n = 50)	Non Anemic (n = 50)	P Value
Age			
Pre School (< 6 Years)	38 (76.0%)	16 (32.0%)	< 0.001 (Significant)
School (≥ 6 years)	12 (24.0%)	34 (68.0%)	
Sex			
Male	31 (62.0%)	32 (64.0%)	0.836 (Not Significant)
Female	19 (38.0%)	18 (36.0%)	
Mother Occupation			
Agricultural Work	6 (12.0%)	6 (12.0%)	0.679 (Not Significant)
Other Work	7 (14.0%)	9 (18.0%)	
Home Maker	36 (72.0%)	34 (68.0%)	
Expired	0 (0.0%)	1 (2.0%)	
Student	1 (2.0%)	0 (0.0%)	
Father Occupation			
Agricultural Work	8 (16.0%)	3 (6.0%)	0.178 (Not Significant)
Expired	0 (0.0%)	1 (2.0%)	
Other Work	42 (84.0%)	46 (92.0%)	
Mother Education			
Educated	45 (90.0%)	46 (92.0%)	0.727 (Not Significant)
Illiterate	5 (10.0%)	4 (8.0%)	
Father Education			
Educated	48 (96.0%)	49 (98.0%)	0.558 (Not Significant)
Illiterate	2 (4.0%)	1 (2.0%)	
Source of Drinking Water			
Tap Water	46 (92.0%)	49 (98.0%)	0.359 (Not Significant)
Hand Pump	4 (8.0%)	1 (2.0%)	

In the table no. 2 shows that the 53 were Iron deficiency Anemic and 47 were Non Iron Deficiency Anemic with respect to the Mean Corpuscular Volume. In total 63 children were male including 32 (50.8%) in the Iron Deficiency anemic group and 31 (49.2%) in the non Iron Deficiency anemic group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.564) [Table 2].

The frequency distribution of individual characteristics was studied among the Iron Deficiency Anemic and Non Iron Deficiency Anemic group with respect to the Mean Corpuscular Volume (table 2). There is no statistical significant difference in all individual characteristics but Hemoglobin is statistically significant among Iron Deficiency Anemic and Non Iron Deficiency Anemic group with respect to the Mean Corpuscular Volume. Also high prevalence of Educated Mothers (88.7%), Educated Fathers (98.1%) and those consuming Tap water (94.3%) were found among the anemia and group. The Prevalence of Iron Deficiency Anemia by Haemoglobin is 64.2% and also statistically significant difference between Anemic and Non Anemic group with Iron Deficiency Anemia.

Table No. 2: Frequency Distribution of Individual characteristics among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to Mean Corpuscular Volume.

Variable / Group	Iron Deficiency Anemia (n = 53)	Non Iron Deficiency Anemia (n = 47)	P Value
Age			
Pre School (< 6 Years)	32 (60.4%)	22 (46.8%)	0.174 (Not Significant)
School (≥ 6 years)	21 (39.6%)	25 (53.2%)	
Sex			
Male	32 (60.4%)	31 (66.0%)	0.564 (Not Significant)
Female	21 (39.6%)	16 (34.0%)	
Mother Occupation			
Agricultural Work	5 (9.4%)	7 (14.9%)	0.645 (Not Significant)
Other Work	8 (15.1%)	8 (17.0%)	
Home Maker	38 (71.7%)	32 (68.1%)	
Expired	1 (1.9%)	0 (0.0%)	
Student	1 (1.9%)	0 (0.0%)	
Father Occupation			

Cont... **Table No. 2: Frequency Distribution of Individual characteristics among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to Mean Corpuscular Volume.**

Agricultural Work	8 (15.1%)	3 (6.4%)	0.227 (Not Significant)
Expired	0 (0.0%)	1 (2.1%)	
Other Work	45 (84.9%)	43 (91.5%)	
Mother Education			
Educated	47 (88.7%)	44 (93.6%)	0.609 (Not Significant)
Illiterate	6 (11.3%)	3 (6.4%)	
Father Education			
Educated	52 (98.1%)	45 (95.7%)	0.916 (Not Significant)
Illiterate	1 (1.9%)	2 (4.3%)	
Source of Drinking Water			
Tap Water	50 (94.3%)	45 (95.7%)	0.748 (Not Significant)
Hand Pump	3 (5.7%)	2 (4.3%)	
Haemoglobin			
Anaemic	34 (64.2%)	16 (34.0%)	0.003 (Significant)
Non Anaemic	19 (35.8%)	31 (66.0%)	

In the table no. 3 shows that the 68 had Iron deficiency Anemia and 32 had Non Iron Deficiency Anemia with respect to the Red Cell Distribution Width. In total 63 children were male including 43 (68.3%) in the Iron Deficiency Anemia group and 20 (31.7%) in the Non Iron Deficiency Anemia group. Chi square test showed no significant difference between the two groups regarding Gender (p = 0.943) [Table 3].

The frequency distribution of individual characteristics was studied among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to the Red Cell Distribution Width (table 3). There is no statistical significant difference found for all individual characteristics but Age and Hemoglobin is statistically significant among Iron Deficiency Anemic and Non Iron Deficiency Anemia group with respect to the Red Cell Distribution Width. Also high prevalence of Educated Mothers (89.7%), Educated Fathers (95.6%) and those consuming Tap water (94.1%) was found in the anemia group. The Prevalence of Iron Deficiency Anemia by Haemoglobin is 58.8% and also statistically significant difference between Iron deficiency Anemic and Non Iron deficiency Anemic group.

Table No. 3: Frequency Distribution of Individual characteristics among the Iron Deficiency Anemia and Non Iron Deficiency Anemia group with respect to Red Cell Distribution Width.

Variable / Group	Iron Deficiency Anemia (n = 68)	Non Iron Deficiency Anemia (n = 32)	P Value
Age			
Pre School (< 6 Years)	43 (63.2%)	11 (34.4%)	0.007 (Significant)
School (≥ 6 years)	25 (36.8%)	21 (65.6%)	
Sex			
Male	43 (63.2%)	20 (62.5%)	0.943 (Not Significant)
Female	25 (36.8%)	12 (37.5%)	
Mother Occupation			
Agricultural Work	10 (14.7%)	2 (6.3%)	0.612 (Not Significant)
Other Work	11 (16.2%)	5 (15.6%)	
Home Maker	45 (66.2%)	25 (78.1%)	
Expired	1 (1.5%)	0 (0.0%)	
Student	1 (1.5%)	0 (0.0%)	
Father Occupation			
Agricultural Work	10 (14.7%)	1 (3.1%)	0.170 (Not Significant)
Expired	1 (1.5%)	0 (0.0%)	
Other Work	57 (83.8%)	31 (96.9%)	
Mother Education			
Educated	61 (89.7%)	30 (93.8%)	0.776 (Not Significant)
Illiterate	7 (10.3%)	2 (6.3%)	
Father Education			
Educated	65 (95.6%)	32 (100.0%)	0.563 (Not Significant)
Illiterate	3 (4.4%)	0 (0.0%)	
Source of Drinking Water			
Tap Water	64 (94.1%)	31 (96.9%)	0.922 (Not Significant)
Hand Pump	4 (5.9%)	1 (3.1%)	
Haemoglobin			
Anaemic	40 (58.8%)	10 (31.3%)	0.010 (Significant)
Non Anaemic	28 (41.2%)	22 (68.8%)	

Table no. 4 shows that the relationship of Mean Corpuscular Volume and Red Cell Distribution Width between different levels of Anemia. 50 were anaemic and 50 were non anaemic. Out of 50 children were anemic including 17 (34.0%) in the Mild Anemic, 21 (42.0%) in the Moderate anemic and 12 (24.0%) in the severe anemic. The chi-square test showed that there is statistically significant difference between Iron deficiency anemia by haemoglobin levels.

Table No. 4: Relation of Anemia with category of MCV and RDW.

Variable / Group	Haemoglobin				P Value
	Normal (≥ 11 g/dl)	Mild Anemia (10 - 10.9 g/dl)	Moderate Anemia (8 - 9.9 g/dl)	Severe Anemia (≤ 8 g/dl)	
MCV < 70 fL	19 (38.0%)	10 (58.8%)	15 (71.4%)	9 (75.0%)	0.019 (Significant)
MCV ≥ 70 fL	31 (62.0%)	7 (41.2%)	6 (28.6%)	3 (25.0%)	
RDW ≤ 14.5	28 (56.0%)	11 (64.7%)	19 (90.5%)	10 (83.3%)	0.023 (Significant)
RDW > 14.5	22 (44.0%)	6 (35.3%)	2 (9.5%)	2 (16.7%)	

Discussion

Lead pollution is substantial health problem in a developing country like India. The effect of lead on haematological system results inhibition of heme biosynthesis in anemia. This study, a hospital bade prospective study of blood leads levels in children with anemia include analysis of blood lead levels in 100 children.

In our study, Approximately half of the children in this study had haemoglobin> 1 g/dl, which is similar to previous estimate made for children [12,13].

In our study, out of 50 children with anemic, 46 (92.0%) children had drinking water source from tap water, 4 (8.0%) children had source from hand pumps but there was no statistical significance.

In the study done by Jain et. al. [14] and Amal et. al. [12] .children with higher blood lead levels had consumed piped water but there was no statistical significance.

In our study, out of 53 children with Iron deficiency by Mean corpuscular volume < 70 fL, 34 (64.2%) were anemic and 19 (35.8%) were non anemic. Out of 47 children with MCV > 70 fL, 16 (34.0%) were anemic and 31 (66.0%) were non anemic. Also there was statistically significant difference with Iron deficiency anemia in relation to MCV.

In our study, Out of 68 children with Iron deficient by Red Cell Distribution width > 14.5, 40 (58.8%) were anemic and 28 (41.2%) were Non anemic. Out of 32 Children with RDW < 14.5, 10 (31.3%) were anemic and 22 (68.7%) were Non anemic. Also there

was statistically significant difference between Iron Deficiency anemia in relation to RDW.

Ahmed et al [15] concluded that lead exposed iron deficient children had significantly higher blood lead levels as compared to control and observed that iron deficiency combination with lead exposure synergistically elevates blood lead levels and susceptibility to its harmful effects in children is seen. Also indicated that elevated blood lead levels (> 10 mcg/dl) in children were significantly associated with risk of anemia.

In our study, Out of 50 children were anaemic including 17 (34.0%) in the Mild Anemic, 21 (42.0%) in the Moderate anemic and 12 (24.0%) in the severe anemic. The using chi-square test showed that there was statistically significant difference between Iron deficiency anemia by haemoglobin levels.

Conclusion

Prevalence of Iron Deficiency anemia by MCV and RDW was 64.2% and 58.8%. However a significant difference between the anemic and Non anemic group regarding MCV and RDW. Lead levels were measured and higher lead levels >10 mcg/dl noted.According to the study, there is minimal lead exposure and no lead toxicity in this area.

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

Source of Funding- Self

Conflicts of Interest- Nil

Abbreviations:

IDA - Iron Deficiency Anemia

RBC - Red blood cell count

Hb- Hemoglobin

Hct- Hematocrit

MCV-Mean corpuscular volume

MCH - Mean corpuscular hemoglobin

MCHC-Mean corpuscular hemoglobin concentration

RDW- Red cell distribution width

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