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ORIGINAL RESEARCH ARTICLE

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A study on socio-demographic profile and morbidity pattern of traffic policemen in an urban area of Madurai city, Tamilnadu

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ABSTRACT

Background: The occupational environment plays a major role on the health of workers and the severity increases with increase in duration of exposure. Traffic policemen are one of the most vulnerable groups to various illnesses as they are exposed to dust, noise, fumes, ultra-violet radiation during their work. **Objectives:** To assess the morbidity pattern and the health seeking behavior among the traffic policemen in Madurai city. **Methods:** A cross sectional study was conducted from August to November 2017 among 239 traffic policemen in Madurai city using a pretested, semi structured, questionnaire for interview and clinical examination. Data were entered in Excel and analyzed using SPSS version 16. **Results:** About 88% of the study participants underwent regular master health checkups of which 76% of the study participants had master health checkups once a year. Government hospitals were being accessed by 69% of traffic policemen. 29.3% were suffering from hypertension, 26.8% were suffering from respiratory problems, 25.1% suffered from gastrointestinal problems, 22.2% suffered from Musculoskeletal disorders, 10.9% had varicose veins. There was a significant association between BMI and varicose veins (P = 0.001) and age with hypertension (P = 0.007) and also age with diabetes mellitus (P = 0.01).**Conclusion:** Hypertension, respiratory problems and gastrointestinal problems were found to be the major health problems among the traffic policemen. Lifestyle modification and importance of maintaining normal weight can be educated to all traffic policemen. Implementation of health insurance schemes and periodical health checkups shall be conducted. Health education and counseling sessions shall be done regularly to traffic policemen.

Key Words: Traffic policemen, morbidity pattern, health seeking behavior

INTRODUCTION

The occupational environment plays a major role on the health of workers and the severity increases with increase in duration of exposure. In the last decade, the traffic population has grown enormously and there is an increase in vehicular traffic polluting the atmosphere. The traffic policemen play a significant role to ensure a smooth flow of traffic. Untimed eating habits, stressful job environment, near sedentary life style as they stand in one place for most of the day have increased their risk of non-communicable diseases.[1,2]

Human activity, industrialization and rapid urbanization have resulted in increase in outdoor air pollution which causes harmful effects which may appear as acute health effects or on a later stage as chronic debility. The health effects of air pollution can be respiratory illness such as asthma, lung cancer, change in lung functions, aggravation of preexisting cardiovascular and respiratory diseases, arrhythmia, heart failure, irritation of eyes nose throat, headache, fatigue.[3-6]

Noise pollution is another environmental hazard which has detrimental health hazards.[7] Health effects of noise include both the auditory as well as non-auditory effects.[8] Even though the Government is providing health checkups to assess their health status, the morbidity pattern of traffic policemen is the need of the hour so that appropriate preventive measures can be recommended. **Objectives:** To assess the morbidity pattern of traffic policemen in Madurai city 2.To assess the health seeking behavior among traffic policemen.

MATERIAL AND METHODS

A cross sectional study was conducted over a period of four months from August to November 2017 among the traffic policemen in Madurai city. Out of the cities of Tamilnadu, Madurai was selected by convenient sampling method. Ethical clearance was obtained from the Institutional Ethical Committee, Madras Medical College, Chennai. Official permission to conduct the study was obtained from the Commissioner of police, Madurai after explaining about the need for the study. Traffic policemen who had been involved in regulating traffic for more than 6 months were included in

the study. Universal sampling frame was prepared by obtaining the list of all traffic policemen meeting the inclusion criteria from Madurai Traffic department. As on 1.7.2017, 256 traffic policemen met our inclusion criteria.

Table 1. Socio-demographic details of the respondents (n = 239).

Socio-demographic details		Frequency (%)
Age (in years)	20-29	2 (0.8)
	30-39	52 (21.8)
	40-49	79 (33.1)
	50-59	106 (44.4)
Gender	Male	235 (98.3)
	Female	4 (1.7)
Marital Status	Married	237 (99.2)
	Unmarried	2 (0.8)
Education	High School	127 (53.1)
	Undergraduate	
	Postgraduate	99 (41.4)
		13 (5.4)
Occupation	Police Constable	21 (8.8)
	Head Constable	115 (48)
	Sub Inspector	95 (40)
	Inspector	6 (2.5)
	Assistant Commissioner	2 (0.7)
Years Of Experience (in years)	1-3	117 (49)
	4-6	88 (36.8)
	7-9	21 (8.8)
	10-12	13 (5.4)

Table 2. Distribution of study participants according to the personal habits (n=239)

Self-reported Practices	Frequency (%)
Smoking	27 (11.3)
Alcohol	20 (8.4)
Tobacco chewing	9 (3.8)
Without any personal habits	183(76.5)

Table 3. Distribution of study participants according to the BMI (n=239)

BMI	Frequency (%)
Normal (18.5-24.99)	93 (38.9)
Overweight(≥25- 29.99)	129 (54)
Obese (≥ 30)	17 (7.1)

There were 6 traffic police stations in Madurai and the Inspectors of all the traffic police stations were briefed about the study in advance and were requested to assemble the policemen in their station on a particular day and time. Each police station was visited during the prefixed date. Traffic policemen who gave informed written consent were interviewed. The data collection procedure included interview by questionnaire and clinical examination. Pretested, semi-structured questionnaire was used for interview. Height, weight, waist circumference, hip circumference and blood pressure were measured. A systolic blood pressure >140

Table 4. Distribution of study participants according to the Morbidity pattern

Health condition	Frequency (%)
Hypertension	70 (29.3)
Respiratory problems	64 (26.8)
Gastrointestinal problems	60 (25.1)
Known case of Diabetes	59 (24.7)
Joint pain	53 (22.2)
Back pain	53 (22.2)
Eye sight defects	27 (11.3)
Varicose veins	26 (10.9)
Recurrent Headache	24 (10)
Redness of eye	17 (7.1)
Heart disease	11 (4.6)
Asthma	10 (4.2)
Hearing defects	9 (3.8)
Renal colic	6 (2.5)
Skin disease	3 (1.3)
History of Tuberculosis	0

Figure 1. Frequency of master health checkups among the study participants

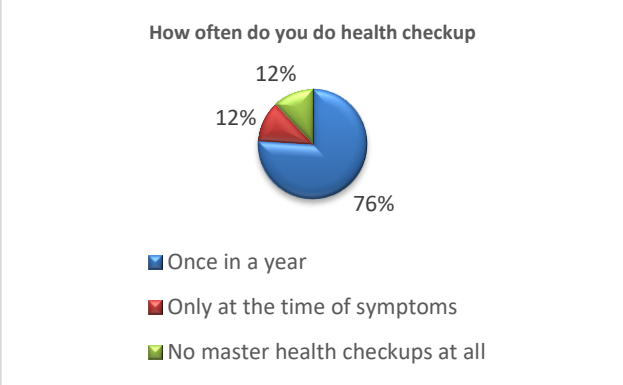

Figure 2. Preference of health facility among study participants

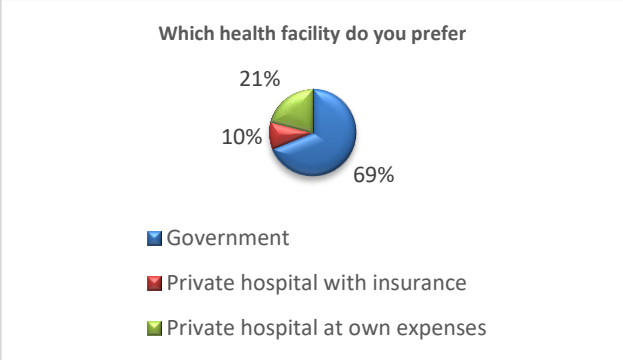

Table 5. Association of BMI, age and experience with Hypertension, Diabetes and varicose veins

Variables		Hypertension		Diabetes		Varicose veins
		Hypertensive	Normal	Diabetic	Normal	Present
BMI	Normal	22	71	22	71	2
		23.70%	76.30%	23.70%	76.30%	2.20%
	Overweight	41	88	29	100	20
		31.80%	68.20%	22.50%	77.50%	15.50%
	Obese	7	10	8	9	4
		41.20%	58.80%	47.10%	52.90%	23.50%
P value		0.215		0.09		0.001*
Age group	20-29 years	0	0	2	0	2
				100%		100%
	30-39 years	9	5	48	3	50
		17%	9.40%	90.60%	5.70%	94.30%
	40-49 years	19	22	57	9	70
		24.10%	27.80%	72.20%	11.40%	88.60%
	50-59 years	42	32	73	14	91
		40%	30.50%	69.50%	13.30%	86.70%
P value		0.007*	0.01*		0.49	
Experience category	1-3 years	40	28	89	15	102
		34.20%	23.90%	76.10%	12.80%	87.20%
	4-6 years	19	21	67	7	81
		21.60%	23.90%	76.10%	8%	92%
	7-9 years	7	6	15	2	19
		33.30%	28.60%	71.40%	9.50%	90.50%
	10-12 years	4	4	9	2	11
		30.80%	30.80%	69.20%	15.40%	84.60%
P value		0.23		0.87		0.61

***Fischer's Exact Test**

mm Hg or Diastolic blood pressure > 90mm Hg were taken as hypertension. Varicose veins were checked by Trendelenberg test. Those who were on long leave, who were on deputation to other department/city and those who were not available on 3 consecutive visits were excluded from the study. Hence a total of 239 responses were obtained.

The data was entered in MS Excel and was analyzed using SPSS version 16. Descriptive statistics such as proportions, mean, and standard deviation (SD) were used and inferential statistics such as Fischer's exact test and Chi square test were used. P value < 0.05 was considered significant. Data were expressed in graphs, tables and charts wherever necessary.

RESULTS

Out of the 239 participants, 21 were police constables, 115 were head constables, 95 were sub inspectors, 6 were inspectors and 2 were Assistant Commissioners. The Mean age of the study participants was found to be 47 ±7.7 Years. 98.3 % of them (235) were male and almost all (99.2%) were married. Regarding education, 5.4% had completed post-graduation. The median years of experience was found to be 4 years. Mean hours of duty daily was 8.27 ± 0.55 hours and the mean monthly income was Rs.33890 ± 5978. (Table 1)

About 11.3% of study participants reported as smokers and 8.4% of study participants reported as alcoholics. 3.8% used tobacco in chewable form. Remaining 76.5% of study participants mentioned they have not used tobacco or alcohol previously or in the present. (Table 2)

The Mean height of the study participants was found to be 171 ± 3.2 cms and the mean weight was found to be 76.9 ± 8.8 kgs. The mean systolic BP was found to be and the mean diastolic BP was found to be . On measuring the BMI among the traffic policemen, 7.1% (17) were found to be obese and 54% (129) were found to be overweight. (Table 3)

About 88% of the study participants underwent regular master health checkups of which 76% of the study participants had master health checkups once a year. 12% of the study participants said they visit a health facility only at the time of symptoms.(Fig.1)

Government hospitals were being accessed by 69% of traffic policemen and private hospitals with insurance were approached free of cost by 10% of the study participants. 21% of the study participants mentioned that they accessed private hospital at their own expenses.(Fig.2)

Among study participants, 29.3%(70) were suffering from hypertension. Out of the 70 hypertensive, 60 were on regular treatment. Remaining 10 participants had an irregular treatment history with antihypertensive drugs. 26.8% were suffering from respiratory problems like cough with expectoration, breathlessness, dry cough, running nose, sneezing and 4.2% reported as known asthmatic on treatment. 24.7% were suffering from diabetes mellitus. 25.1% suffered from gastrointestinal problems like gastritis, acidity, indigestion, constipation, flatulence, irregular bowel habits, decreased appetite, and abdominal distension. Musculoskeletal disorders like back pain and joint pain were reported by 22.2%. 11.3% had eye sight defects including myopia, presbyopia and 7.1% had redness of eye. 10.9% had varicose veins. 4.6% had heart disease including angina, previous treated MI of which they were on regular treatment. 3.8% of study participants had hearing defects like reduced hearing and also tinnitus to loud noise. 2.5% had renal colic and also 1.3% had skin problems like eczema, rashes and fungal infections. (Table 4)

There was a significant association between BMI and varicose veins (P = 0.001) and age with hypertension (P = 0.007) and also age with diabetes mellitus (P = 0.01). However there is no significant association between experience and hypertension, diabetes, varicose veins.
(Table 5)

DISCUSSION

Occupational hazards now play a major role in the health of individuals. Traffic policemen owing to their occupation are constantly toiling for long hours of duty daily in the scorching sun. Madurai, a major city in India, owing to its cultural and religious background has an increasing number of automobiles. Increase in number of vehicles and rapid urbanization leads to irregular diet habits, prolonged standing in the sun and less self care owing to health hazards among the traffic policemen.

Self reported smoking was found to be 11.3% in our study. This was similar to studies done by Santosh.J.Haralkar et al in Solapur which showed smoking addiction of 7.02%.(9) In our study alcohol addiction was found to be 8.4% similar to studies done by Santosh.J.Haralkar et al in Solapur and Ravindra et al in Thane which showed alcohol addiction to be 18.42% and 8.95% respectively. Tobacco chewing was found to be 3.8% in our study whereas studies done in Solapur and Thane showed 21.93% and 26.87% respectively(9)(10). Similar results were also seen in a study done in Ahmadabad which showed addiction of smoking, alcohol and tobacco chewing to be 23%, 12% and 28% respectively(11). Smoking seemed to be the major addiction than tobacco chewing in our study.

In our study 7.1% was found to be obese and 54% were found to be overweight. BMI greater than 25 were taken as overweight and greater than 30 were taken as obese in our study. Similar results were found in studies conducted in Thane which showed 50.74% of participants as overweight and none as obese(10). A study conducted in Brahmapur showed 38.3% of participants as overweight and 8.5% as obese(2). Similar study conducted in Solapur showed 63.16% of traffic policemen having BMI more than 25(9).

In our study 88% of study participants underwent regular health checkups of which 76% of study participants had master health checkups once a year. Majority of traffic policemen (69%) access Government hospitals at the time of complaints and for health checkups. Private hospitals are being accessed by 10% of participants under insurance coverage. 21% of traffic policemen visit private hospitals at their own expenses (out of the pocket expenditure).

In our study, 29.3% of traffic policemen (70) were suffering from hypertension. This was similar to a study done in Brahmapur which showed 25% of subjects were hypertensives(2). Similar studies done in Ahmadabad and Thane showed hypertensive as 18% and 8.95% respectively(11)(2).

In our study 26.8% were suffering from respiratory problems like cough with expectoration, breathlessness, dry cough, running nose, sneezing and asthma. Similar studies done in Solapur, Ahmadabad, Thane, Brahmapur showed prevalence of respiratory problems as 27.19%, 21%, 11.9%, and 16% respectively(2,9–11).

In our study 24.7% were suffering from diabetes mellitus. Similar studies done in Solapur, Ahmadabad and Thane showed prevalence of diabetes as 8.7%, 7% and 1.4% respectively(9–11).

And 25.1% suffered from gastrointestinal problems like gastritis, acidity, indigestion, constipation, flatulence, irregular bowel habits, decreased appetite, and abdominal distension. Studies done in Thane and Solapur showed 50.75% and 11.4% respectively(9,10). Musculoskeletal disorders like back pain and joint pain were reported by 22.2%. Studies done in Thane, Brahmapur, Solapur were found to be 37.3%, 27.08%, 20.18%(2,9,10). In our study 10.9% (26) had varicose veins. Studies done in Ahmadabad and Brahmapur showed 20% and 4.1% respectively(2,11).

In our study, there was a significant association between BMI and varicose veins, however there was no significant association between BMI and hypertension which was similar to the study done in Brahmapur which did not show a significant association(2).

In our study, there was a significant association between age and hypertension and also age with diabetes mellitus. This was similar to a study done in Ahmadabad

which showed significant association between age and hypertension among traffic policemen(11).

In our study, there was no significant association between years of experience and hypertension, diabetes, varicose veins. This is different from the study done in Ahmadabad which showed a significant association between years of experience and varicose veins(11).

Conclusion:

Hypertension, respiratory problems and gastrointestinal problems were found to be the major health problems among the traffic policemen. 54% were found to be overweight and 7.1% were found to be obese. Lifestyle modification and importance of maintaining normal weight can be educated to all traffic policemen. Implementation of health insurance schemes and periodical health checkups shall be conducted. Health education and counseling sessions shall be done regularly to traffic policemen.

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A Clinico-Epidemiological study of the burden and outcome of Vector Borne Diseases in a Tertiary Care Hospital, Bengaluru

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ABSTRACT

Background: Vector borne diseases (VBDs) represent a substantial burden in many low and lower middle-income countries, including India. India has become hyper endemic for Dengue, and has the largest population in the world at risk of malaria. In view of rising incidence and geographical spread of VBDs, we conducted a study of vector borne disease admissions and outcomes in a major teaching hospital of Bengaluru, with the aim of determining the sociodemographic profile, bed occupancy rates, treatment outcomes. Methods: We analysed case sheets of all patients admitted for suspected vector borne diseases, during the period 1st January to 31st December 2012, in a major tertiary care and teaching hospital located centrally in Bengaluru city. Results: During January-December 2012, 12696 patients were admitted to medicine wards, of whom suspected VBDs numbered 1209, i.e.10% approximately. Majority of patients were males aged 16-25 years, residents of Bengaluru, Tumakuru and Chikkaballapur. Highest number of admissions occurred in August and September, and lowest in May. Dengue was confirmed in 376 patients and malaria in 78, and 3 patients tested positive for Chikungunya. Average bed occupancy was 4 days/patient. Fifty patients died, giving a mortality outcome of 4.14% among VBD cases and proportional VBD mortality of 2.95% out of 1696 total deaths in Medicine wards. Conclusions: In view of rapid expansion of Bengaluru city and urbanization of surrounding areas, with inevitable unplanned construction and ecological modification, we may expect the incidence of vector borne diseases to increase further in future, with resultant heavy burden of morbidity, mortality and increased stress on the health care delivery systems. It is imperative to carry out widespread mosquito control measures and conduct comprehensive grassroots awareness and education campaigns to minimise the incidence of vector borne diseases.

Key Words: Vector-borne Diseases, Dengue, Malaria, Bengaluru, Morbidity and mortality.

INTRODUCTION

Vector borne diseases (VBDs) represent a substantial burden in many low and lower-middle income countries, including India. Globally, VBDs are endemic in more than 100 countries. These diseases affect more than half of the world's population; they are difficult to predict, prevent or control and to add to the complexity, for most VBDs there is no available vaccine.(1) Dengue epidemics have become more severe, spreading to newer areas which were not endemic until a few years ago. The number of dengue cases has increased over the last three to five years, with recurring epidemics. Every 10 years, the average annual number of cases of Dengue Fever/Dengue Haemorrhagic Fever (DF/DHF) cases reported to the World Health Organization (WHO) continues to grow exponentially. With all four serotypes of the virus detected, India has now become hyper endemic for Dengue. The risk factors, which play a key role in the spread and transmission of dengue and chikungunya include demographic and social changes, globalization, irregularities in water supply and solid waste management, and increased consumerism and air travel.(2) India is characterized predominantly by unstable malaria transmission, the seasonal transmission being related to rains. Due to the low and unstable transmission dynamic, most of the population has little or no immunity towards malaria.(3) India has the largest population in the world at risk of malaria, with 85% living in malarious zones. The combination of *Plasmodium Falciparum* and *Plasmodium vivax*, six primary malaria vectors, several ecotypes including urban malaria, and various transmission intensities ranging from unstable to hyper endemic create a challenging epidemiological scenario in India.(4) In India epidemics of Japanese Encephalitis (JE) are reported from many parts of the country, and it is considered a major paediatric problem. Approximately 597,542,000 people in India live in JE-

endemic regions, and 1,500 to 4,000 cases are reported every year. (5)

In view of such alarming statistics, we conducted a study of vector borne disease admissions and outcomes in a major teaching hospital of Bengaluru, with the aim of determining the sociodemographic profile of such patients, their bed occupancy rates, treatment outcomes, and other relevant indicators. This report is concerned with admissions for suspected vector-borne diseases for the period January to December 2012.

MATERIAL AND METHODS

Study Area: Our study was done in a major tertiary care and teaching hospital located centrally in Bengaluru city. This hospital is a sentinel surveillance centre for diseases covered under the Integrated Disease Surveillance Programme (IDSP). It has 926 beds, with 189 beds meant for the Medicine Department. On average, 1000 outpatients are seen every day, of whom nearly half are medicine cases.

Study period: We analysed case sheets of all patients admitted for suspected vector borne diseases, during the period 1st January to 31st December 2012.

Sample size: There are, on average, 30 admissions daily in the medicine wards. We expected 15% of these admissions to be for vector borne diseases, and thus calculating, we expected to analyse approximately 1600 case sheets for the year 2012. The final sample size was 1209, comprising all case records for patients admitted with suspected vector-borne disease for the period January to December 2012.

Methods: The Study was undertaken after obtaining clearance from the ethics committee of the teaching institute. Case records were analysed for in-patients admitted with suspected vector borne diseases during the study period. We noted the socio-demographic profile and treatment outcome of these patients. We collected investigation data and results from the Microbiology laboratory of the institute.

Inclusion criteria: All probable/confirmed cases fitting into the IDSP criteria of Vector borne diseases.(6)

RESULTS

Sociodemographic and temporal characteristics: The total number of admissions to Medicine wards during the period January-December 2012 was 12696. Total number of patients admitted with possible vector borne disease was 1209, i.e., approximately 10% of total admissions. The cases were distributed as shown in table 1.

Overall, the majority of patients were males in the age group 16-25 years. The frequency of admission decreased with increasing age, and the male to female ratio was higher in the younger age groups. For older patients, admissions were few and the difference between the numbers of male and female patients was not marked.

As seen in table 2, most of the patients were from Bengaluru (urban as well as rural) district, followed by neighbouring districts of Tumakuru and Chikkaballapur. Also, 44 patients (3.64%) were from neighbouring states namely, Andhra Pradesh and Tamil Nadu. The majority of patients belonged to the Hindu religion, with Muslims accounting for about 14% of the total.

Distinct differences in the number of admissions were observed over the 12-month period as shown in figure 1. The months of August and September witnessed the highest number of admissions, followed by a steady decline till December. In the initial months of the year, admissions were relatively fewer with the fewest cases in May (11 cases; 5 males).

Table 1: Age and sex distribution of patients

Age group in years	Male		Female		Total
	n	%	n	%	
16-25	296	62.44	178	37.55	474
26-35	218	67.28	106	32.71	324
36-45	108	58.06	78	41.93	186
46-55	56	48.69	59	51.3	115
56-65	39	46.42	45	53.57	84
66-75	14	58.33	10	41.66	24
76-85	2	100	0	0	2
Total	733	60.63	476	39.37	1209

X2=21.15,p<0.01

Table 2: Distribution by district and religion

District	n	%
Bengaluru	496	41.03
Tumakuru	283	23.41
Chikkaballapur	119	9.84
Ramanagara	76	6.29
Kolar	50	4.13
Others	141	11.66
Andhra Pradesh	38	3.14
Tamil Nadu	6	0.49
Religion	**n**	**%**
Hindu	1029	85.11
Muslim	168	13.89
Christian	9	0.74
Other	3	0.25
Total	1209	100

VBD cases compared to total admissions: The admission rate to medicine wards over the 12-month period remained fairly constant. However, the contribution of VBD cases fluctuated as shown in table 3 and figure 2. The proportion of patients admitted with suspected VBD ranged from a minimum of less than 1% in the month of May, to a maximum approaching 20% during August and September. The average proportion of VBD patients among total admissions during the year was 9.27%.

Duration of admission: Patients' duration of stay in the hospital ranged from some hours to 24 days, median duration of stay being 4 days. The total number of bed-days was 4883, giving average bed occupancy of 4 days per patient.

Table 3: Monthly VBD cases as percentage of total admissions

Month (2012)	Total medicine ward admissions	Suspected VBD admissions	VBD as percentage of total admissions
January	895	38	4.24
February	904	48	5.3
March	951	26	2.73
April	1071	35	3.26
May	1142	11	0.96
June	1096	125	11.4
July	1104	154	13.94
August	1103	202	18.31
September	1169	207	17.7
October	1115	171	15.33
November	1050	118	11.23
December	1096	74	6.75

Fig. 1: Temporal distribution of cases

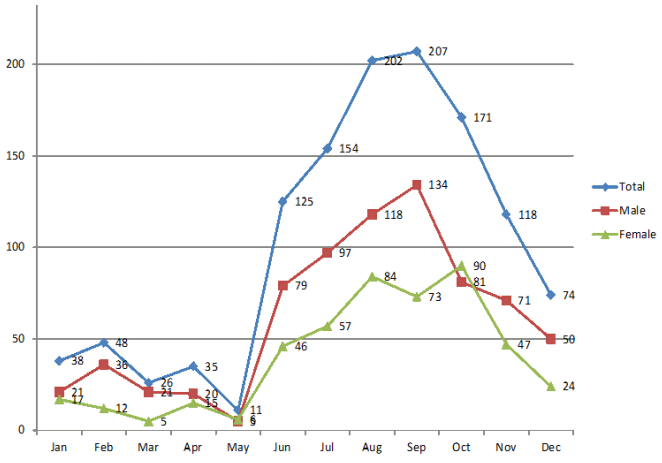
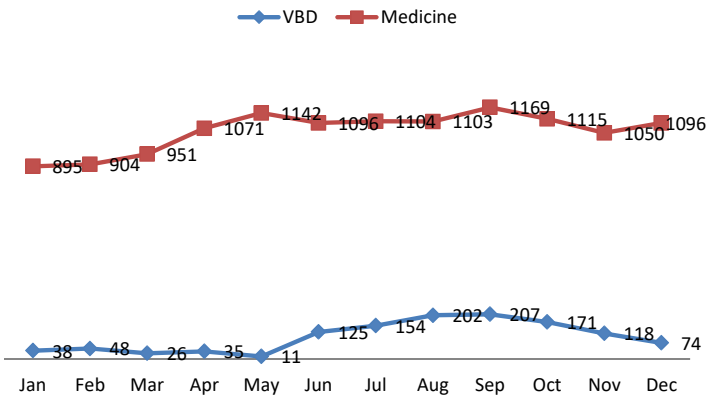


Fig. 2: VBD cases compared to total medicine ward admissions



Provisional and confirmed diagnoses: Most of the cases were admitted as fever with thrombocytopenia, out of which 232 cases tested positive for dengue. 110 cases had a provisional diagnosis of Dengue, of which 63 were confirmed as dengue. 42 of the 187 acute fever cases tested positive for dengue. Overall, 376 patients may be considered as dengue cases based on positive test reports. Of the 35 patients admitted provisionally as Malaria, 11 were confirmed as malaria.

Investigations: Peripheral smears were done for 796 patients, of which 78 were positive. Of these, species identification report available for 73 cases showed that 26 were Plasmodium falciparum, 43 were vivax and 4 smears had both parasite species.

According to the case records, 5 patients were tested for Chikungunya and 3 tested positive.

Treatment:

Malaria: It was observed that 24 cases were given Injectable artemisinin. Oral artemisinin was given to 15 cases.

Dengue: 239 patients were given platelet transfusion. It was also observed that among those who did not receive platelet transfusion, 9 patients did have counts below 20000 per cubic mm.

Treatment outcome: Out of 1209 patients admitted for possible vector borne disease, 979 (80.98%) were classified as improved/cured at discharge, 50 patients (4.14%) died and 171 (14.14%) were discharged against medical advice. The remaining 9 patients were referred elsewhere or absconded. Mortality from suspected vector-borne disease constituted 2.95% of total deaths in Medicine wards (1696), which points towards mostly good outcome for these patients.

DISCUSSION

In this study of patients admitted for suspected vector borne disease, it was observed that the majority of admissions were young adults, with male patients significantly outnumbering female patients, especially in the younger age groups. In the present study, male patients constituted 60.63% and female patients, 39.37% of total admissions. This may be explained by the higher outdoor activity among younger age groups and males, which makes them more exposed to mosquito bites, along with the general clothing norms due to which more body surface area is exposed in males. A similar retrospective study of dengue fever from a teaching institute in Kerala state also reported preponderance of males and young adults, with males accounting for 60.70% and females, 39.29% of total dengue fever cases.(7)

In the present study, most of the admissions were from Bengaluru and surrounding districts, and religion of the patients conformed to the general demography of the population of Karnataka with Hindus in majority followed by Muslims and others.(8)

Majority of the patients presented with symptoms suggestive of dengue. Confirmed diagnosis of dengue was made in 376 patients, and malaria in 78. The highest number of admissions was seen during the monsoon months July to October. This corresponds to known seasonal fluctuations in the incidence pattern of VBDs, with factors like temperature, rainfall and humidity playing a role.

In their 2015 study on Aedes aegypti vector prevalence, Balakrishnan et al(9) obtained data on the incidence of

dengue and chikungunya for the period 2008-2012, from Karnataka state health authorities. Although the data showed dengue and chikungunya to be prevalent in many of the districts, Bengaluru City and its neighbouring districts accounted for a large number of cases, with Bengaluru city accounting for 28.8% of dengue cases during the reporting period. The authors also reported the results of entomological surveillance on the prevalence of Aedes aegypti carried out by the NCDC (National Centre for Disease Control) team during 2012 in selected localities of Bengaluru City, Bengaluru urban and Kolar districts of Karnataka state. The results of the study revealed widespread vector mosquito breeding and the Aedes larval breeding indices ─ House, Container and Breteau ─ for total study area were 23.9, 11.6 and 43.0 respectively. Of the 10 localities surveyed, 9 showed House and Breteau indices above the critical levels. Another study of vector borne diseases conducted by Nazrul Islam et al in Bengaluru(10) reported 51 samples positive for larvae out of 224 larval samples collected, of which 37 were positive for Aedes (27 A. aegypti), 12 for Anopheles, and two were positive for Culex. Such widespread breeding of Aedes aegypti may be the cause of the preponderance of dengue cases observed in the present study.

The mortality among the VBD patients in the present study was found to be 4.14% (2.95% proportional mortality with respect to total medicine ward deaths). This is similar to the 3.2% mortality reported from a 2005 study of dengue in Kollam, Kerala.(11)

Conclusion and recommendations: Vector-borne diseases are both age-old and re-emerging situations, with previously unheard-of complications, changing geographical and epidemiological patterns and the ever-present spectre of drug resistance. In view of rapid and constant expansion of Bengaluru city and urbanization of surrounding areas, with inevitable unplanned construction, water stagnation and ecological modification, we may expect the incidence of vector borne diseases to increase further in future, with resultant heavy burden of morbidity, mortality and increased stress on the health care delivery systems. It is imperative to carry out mosquito control measures on a war footing especially during the monsoon season. It is also highly advisable to conduct widespread grassroots awareness campaigns in order to educate the general population about the modes of spread of vector mosquitoes and preventive and protective measures that can be undertaken at the individual and community levels to minimise the incidence of vector borne diseases.

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Knowledge and practices about breast feeding among mothers – A hospital-based study in Puducherry

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ABSTRACT

Background: Good breastfeeding knowledge and practice is important for adequate immunity, growth and development of a child along with benefits to the mother. Various socio-cultural factors influence the practice of breastfeeding across region, hence it is important to assess and improve the knowledge and practice of the same. **Objective:** To determine the knowledge and practices related to breast feeding and their association with socio-demographic factors. **Materials and Methods:** A facility based cross sectional study was conducted at Pediatric department of Mahatma Gandhi Medical College, Puducherry for two months from 1st August 2016 to 30th September 2016. All eligible mothers who visited the Pediatric department during the two months period were included in the study and were interviewed using a semi-structured questionnaire. **Results:** 61.2% had knowledge that breastfeeding should be initiated within one hour of birth and 76% knew about colostrum. Majority (91%) knew about the proper duration of exclusive breast feeding while 70.2% knew that breastfeeding should be given to child even during mother's common illness. Total 90% of mothers were aware of at least one benefit offered by breast feeding to the child and 36% mothers were aware of at least one benefit to mother. About 97% mothers breast fed their child, of which 64.6% mothers did proper exclusive breastfeeding. Among 238 mothers who practiced breastfeeding, 42.4% mothers practiced on-demand feeding. Knowledge about initiation of breast feeding was significantly higher in those who were more than 25 years of age while knowledge about colostrum was significantly higher among women who were educated up to at least high school or above. **Conclusion:** The findings revealed that majority of mothers have good knowledge and practice of breastfeeding. Since education level of mother and age were found to be associated with some knowledge components, health education regarding breast feeding is highly recommended.

Key Words: Attitudes, Breast feeding, infant feeding practices, Knowledge, Practice, Mothers

INTRODUCTION

Good nutrition during infancy and early childhood is essential to ensure the adequate growth and development of children to their full potential.[1] The World Health Organization (WHO) recommends that infants be exclusively breastfed for the first six months, followed by breastfeeding along with complementary feeding for up to two years of age or beyond.[2] It has been recognized globally that breastfeeding is beneficial for both the child and mother.[3] Infants when exclusively breastfed for the first six months are significantly protected against the major childhood diseases like diarrhea, diabetes, obesity etc. Mothers who exclusively breastfeed their children also have many advantages like reduction in risk of breast cancer and ovarian cancer.[4,5]

Although breastfeeding is universal in India, exclusive breast feeding and appropriate complementary feeding practices rates are not satisfactory. In India, as per National family and Health Survey (NFHS)-4, prevalence of exclusive breast feeding is 41.6%.[6] In few South Indian studies[7,8,9], prevalence of exclusive breast feeding (EBF) was reported from 34% to 71%. Various Socio-cultural factors influence these practices, which vary from region to region. The knowledge and practices regarding breastfeeding practices must be assessed and improved.

In Puducherry, rarely any hospital-based study about knowledge and practices related to breast feeding is conducted, so the present study was conducted to know the same. It attempts to identify the gaps in knowledge and correct practices so that necessary health education can be given to mothers for betterment of the mother and child.

Aims & Objectives:

1) To determine the knowledge and practices related to breast feeding among mothers.
2) To determine the association between socio-demographic factors and knowledge related to breast feeding.
3) To determine the association between socio-demographic factors and practices related to breast feeding.

MATERIAL AND METHODS

A facility based cross sectional study was conducted at Pediatric outpatient department of Mahatma Gandhi Medical College and Research Institute, Puducherry. The study was conducted for two months from August to September 2016. Total 245 mothers visiting paediatric department, having at least one child between 6 months to 23 months age were interviewed. One of the researchers visited the Pediatric OPD and interviewed the subjects using a semi-structured questionnaire. Questions pertaining to socio-demographic details, knowledge and practices related to breast feeding were included. Data compilation and analysis was carried out with Microsoft-Excel and Epi info software (version 7). Data were presented as frequency and percentages. Association with socio-demographic factors was assessed by chi-square test and a p-value of <0.05 was considered statistically significant. Ethical permission was sought from Institutional Human Ethical Committee before conducting the study. Informed written consent was obtained from subjects prior to the interview and confidentiality was maintained.

RESULTS

Total 245 mothers were interviewed between age 20 to 37 years with mean age of 25.3 yrs (SD ±2.9). Most of the mothers (51%) belonged to age group 25 to 30 years. Majority (69%) were from rural area and most (66.9%) had education up to at least high school or above. About 94% were non-working and 56.3% were having only one child.

Table 1: Knowledge of mothers regarding breast feeding

(Figures in parenthesis are percentages, *Multiple responses)

Knowledge	Response	No.(%)
Ideal time to initiation of breast feeding after birth	Correct response (within one hour)	150(61.2)
	Incorrect response	95(38.7)
Colostrum	Correct response (First milk secreted for few days after delivery)	186(75.9)
	Don't know	59(24.1)
Duration of exclusive breast feeding	Correct response (6 months)	222(90.6)
	Incorrect response	23(9.3)
Whether to stop breast feeding the child during mother's common llness?	Correct response (No)	172(70.2)
		172(70.2)
	Incorrect response (Yes)	73(29.8)
Advantages of breast feeding for child*	Improves immunity	205(83.7)
	Healthy food	32(13.1)
	Brain & IQ development	30(12.2)
	To have a healthy child	43(17.6)
	Prevention of diarrhea	2(0.8)
	Don't know	26(10.6)
Advantages of breast feeding for mother*	Prevents breast cancer	117 (29.4)
	Helps to maintain normal weight	22(8.9)
	Acts as contraception	9(3.7)
	Prevents breast related health problems	8(3.3)
	Happiness in mother	4(1.6)
	Improves health of mother	2(0.8)
	Don't know	128(52.2)

Table 2: Practice of mothers regarding breast feeding

Practice	Response	No.(%)
Prelacteal feeding (n-238)	Yes	14(5.9)
	No	224(94.1)
Duration of exclusive breast feeding (n-232)	6 months	150(64.6)
	<6 months	20(8.6)
	>6 months	62(26.7)
Frequency of breast feeding per day during first six months (n-238)	On demand feeding	101(42.4)
	No practice of on demand feeding	137(57.6)
Stopped breast feeding during mother's illness (n-238)	Yes	18(7.6)
	No	220(92.4)
Fed with bottle any time (n-245)	Yes	59(24.8)
	No	186(75.2)
Initiation of breast feeding after birth (n-238)	Within first hour of birth	121(50.8)
	After one hour of birth	117(49.2)

Figures in parenthesis are percentages, *Multiple responses

Of 245 mothers, 61.2% had knowledge that breastfeeding should be initiated within one hour of birth. Majority (90.6%) knew about the duration of exclusive breast feeding and 76% knew about colostrum. Total 70.2% mothers knew that breastfeeding should be given to child even during mother's common illness. Total 90% of mothers were aware of at least one benefit offered by breast feeding to the child. Improving the immunity, being a healthy food, brain & IQ development and prevention of diseases like diarrhea were some of the advantages they reported. Total 36% mothers were aware of at least one benefit to mother such as prevention of breast cancer, acting as contraceptive and improving health and happiness of mother.(Table 1).

Regarding practice, 238 (97.1%) mothers breast fed their child, among these, 232(97.4) mothers did exclusive breastfeeding for some duration. Among these 232, total 150 (64.6%) mothers did exclusive breastfeeding for six months. Among 238 mothers who practiced breastfeeding 42.4% mothers practiced on-demand feeding. (Table 2).

Knowledge about initiation of breast feeding within one hour was significantly associated with age, it was higher in those who were more than 25 years of age. Knowledge about colostrum was significantly higher among women who were educated up to at least high school or above. Regarding knowledge about breast feeding during mother's illness, significantly mothers in 25-30 years age group knew better compared to less than 25 years. (Table 3).

Prelacteal feeding practice was found significantly higher among younger age group mothers (20-25 years). Except prelacteal feeding, none of the practices were having significant association with age or education. (Table 4).

DISCUSSION

In present study, 61.2% mothers had knowledge that breastfeeding should be initiated within one hour of birth which is almost similar to the finding of a study done in 2012 in a rural area of Ajmer, Rajasthan by Karnawat et al.[10],

Table 3: Association of knowledge about breast feeding with age and education of mothers

Variable	Response	Age (yrs)		P value	Education		P value
		20-25 (n=100)	>25 (n=145)		Middle school or less (n=22)	High school or above (n=223)	
Initiation of breast feeding after birth	Correct response (Within one hour)	53(53)	97(66.9)	0.028*	1 6(72.7)	134(60)	0.37
	Incorrect response	47(47)	48(33)		6(27.3)	89(40.0)	
Knowledge about Colostrum	First milk secreted for few days after delivery	76(76)	110(75.9)	0.98	12(54.5)	174(78)	0.014*
	Don't know	24(24)	35(24.1)		10(45.5)	49(22)	
Whether breast feeding should be stopped during mother's illness?	Correct response (No)	63(63)	109(75.2)	0.041*	10(45.5)	63(28.3)	0.09
	Incorrect response (Yes)	37(37)	36(24.8)		12(54.5)	160(71.7)	

Figures in parenthesis are percentages, *significant

Table 4: Association of breastfeeding practices with age and education of mothers

Practice		Age		P value	Education		P value
		20-25	≥25		Middle school or less	High school or above	
Frequency of breast feeding per day during first six months	On demand	36(37.5)	65(45.8)	0.2	12(60)	89(40.8)	0.09
	No on demand feeing	60(62.5)	77(54.2)		8(40)	129(60.2)	
Duration for exclusive breast feeding (n=232)	6 months	62(66.7)	88(63.3)	0.6	12(66.7)	138(65.1)	0.6
	More or less than 6 months	31(33.3)	51(36.7)		8(33.3)	74(34.9)	
Stopped breast feeding during mother's illness (n=238)	Yes	10(10.4)	8(5.6)	0.17	1(5)	17(7.8)	0.65
	No	86(89.6)	134(94.3)		19(95)	201(92.2)	
Fed with bottle any time (n=245)	Yes	27(27)	32(22.1)	0.37	7(31.8)	52(23.3)	0.37
	No	73(73)	113(77.9)		15(68.2)	171(76.7)	
Initiation of breast feeding after birth(n=238)	Within one hour	51(53.1)	70(49.3)	0.09	15(75)	106(48.6)	0.06
	After one hour	45(46.9)	72(50.7)		5(25)	112(51.4)	
Prelacteal feeding(n=238)	Yes	10(10.4)	4(2.8)	0.015*	0(0)	14(6.4)	0.24
	No	86(89.6)	138(97.2)		20(100)	204(93.6)	

while it was higher in a South Indian study in 2015 by Balaji Chinnasami et al.[11] The same study also reported a 75% knowledge of colostrum among study subjects, which is similar to our present study finding where majority (75.9%) of the mothers knew about colostrum. Our study found that 36.7% had knowledge about on demand feeding of the child while 3.7% had no knowledge about frequency of breast feeding. A study by Mittal et al. in 2013 in Rajasthan found that 57% knew that baby should be breastfed on demand.[12]

Regarding knowledge of exclusive breast feeding (EBF), 91% knew that it should be done for first six months which is similar to the study by Vijayalakshmi P et al. in 2014 in Bangalore, where 85.2% mothers had this knowledge.[13] Their study also reported that 68% had knowledge to continue breastfeeding up to 2 years[13], while in present study it was 86.1%.

In our study, 89.4% mothers were aware of any benefit offered by breast feeding to the child, which is similar to the finding (96.3%) by Kamath et al. in their study on perceptions of breastfeeding done in 2012, among post-natal women in a tertiary hospital at Mangalore.[14] In present study, only some mothers (36%) knew about the benefits to the

mother. It may be due to the less common discussion of advantages for mother by the health care provider or media. If the mothers are made aware about benefits to them, then probably the prevalence of breast feeding may increase.

In present study, we found that only the knowledge about initiation of breast feeding within one hour was significantly associated with age (p-0.028), which was higher in those who were more than 25 years of age. It may be due to the past experience as there may be mothers in higher age group who had two children. Karnawat D et al. in their study found that knowledge of choice of milk for newborn was significantly associated with place of residence while other socio demographic factors were not significant.[10]

Present study found that the knowledge about colostrum was significantly associated with education (p-0.014), knowledge was higher among those whose educational level is at least high school or above. It could be due to the fact that importance of breastfeeding is included in teaching at high school level. Choudhary AK et al. in 2014 in their study on postnatal mothers in central India , found education to be a significant determinant of good knowledge of breastfeeding.[15]

In present study, it was found that total 97% mothers breastfed their child anytime. The only reason cited by 3% mothers who didn't breast fed the child was "Insufficient or very less milk secretion", it is a one of the common reasons cited by mothers in India. Kamath et al. in their hospital based study on practice of breastfeeding also found lack of secretion to be the common reason for not breastfeeding.[14]

In present study, 66.4% mothers-initiated breast feeding within one hour of delivery which is similar to the finding observed in NFHS-4 in Puducherry, where 65.3% children were breastfed within one hour of birth.[6] In a study at Indore during 2004-05 it was found to be 54.5%.[16] Hence early initiation of breast feeding is better in Puducherry compared to other parts of India. On a Global level, in developing countries, only 39% of newborns are put to the breast within one hour of birth.[17]

In our study we found that among those who practiced breast feeding ever, 42.2% gave breastfeed on demand. In a study by Balaji et al. in South India, it was found that 45% mothers gave breastfeeding at two hourly intervals and 72% mothers gave EBF for six months.[11] In developing countries, only 37% of infants under six months of age are exclusively breastfed.[17] In our study, EBF for six months was practiced by 64.6% mothers. It is higher than the finding (45.5%) in NFHS-4 in Puducherry.[6]

Pre-lacteal feeding practice is observed in many countries. Two studies, one from South Nepal and other from Pakistan reported prevalence of pre-lacteal feeding as 55.6% and 87.6% respectively.[18,19] The practice of prelacteal feeding varies across India. Kumar et al. (2009) in Chandigarh found 40% prevalence of prelacteal feeding.[20] These figures are very high compared to our study where only 5.9% gave prelacteal feeding. Those who gave prelacteal feed, they used lactogen, cow's milk or jaggery water.

In present study, among those who breast fed their children, EBF for six months was seen more in mothers who were educated till middle school or less compared to those who were educated more, but this as well as other differences regarding breast feeding practices were not significant. Prelacteal feeding was significantly higher in younger age group, it may be due to the possibility that it was a first child and they didn't have any previous experience, there may be elderly women in such families who insist usually on age old tradition of giving prelacteal feeds. There was no significant age or education wise difference in practice of initiation of breast feeding within one hour. Similar to our study, education was not associated with early initiation in studies done during 2006 to 2013 at Karnataka, China and Bangladesh.[21-22]

Conclusion:

Present study about knowledge and practices of the mothers regarding breastfeeding revealed that majority of the mothers had good knowledge about breastfeeding and its practice is also favourable. Education level of mother and age were found to be associated with some knowledge components hence health education regarding breast feeding is highly recommended.

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Depression Among Geriatrics: Prevalence And Risk Factors

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ABSTRACT

INTRODUCTION: India in this era of demographic transition, has an enormous geriatric population prone to depression. Presently one in every three elderly suffer from major depression. Even then it is misdiagnosed and undertreated due to social misconceptions and its somatic presentation of mood features, leading to increased morbidity, mortality and health care costs. This could become the second leading cause of disease burden in 2020 **OBJECTIVE:** To know the prevalence and factors associated with depression among elderly. **METHODOLOGY:** A community based cross-sectional study was conducted in rural and urban field practice area of Kanachur Institute of Medical Sciences, Mangalore. In the study conducted for one week, 125 elderly population (>60years) were included. Geriatric depression scale (GDS) 15 and preformed validated questionnaire were used. **RESULTS:** In our study, 89(71.2%) of them belonged to age group 60-70 years, 77(61.6%) were females, 88(70.4%) were married and 78(62.4%) belonged to nuclear family. The prevalence of depression was 47.2%. It was higher in females (53.25%) compared to Males (27.5%). Depression in elderly was associated with paying interests to loans (80%, p <0.001), not satisfied with their children's job (77.5%, p= 0.00011), and children not obeying them (82.5%, p=0.00049). Among those depressed, 64.3% refrained themselves from meeting friends (p <0.001) and 78.43% often felt helpless (p=0.00001).**CONCLUSIONS:** High prevalence of depression reflects the need to focus on greater awareness of depression among general population and making consolidated effort towards its diagnosis and treatment, which may go a long way in reducing morbidity, mortality and in improving their quality of life.

Key Words: Depression; Geriatric, Elderly, Geriatric Depression Scale 15, pension.

INTRODUCTION

Today, Depression is an important public health challenge in developing countries. Approximately 450 million people worldwide are affected with depression according to the estimate, constituting a major portion of mental health disorders[1]. India, the second largest country by population in the world, is undergoing demographic transition with 72 million elderly persons above 60 years of age, which is expected to increase to 179 million in 2031 and further to 301 million in 2051[2]. Demand for health care services and social security will increase with increase in the number of elderly.[3]

Societal modernization has led to breakdown in family values and the framework of family support. Ongoing economic development has led to migration of children to urban areas leaving their parents alone at home. This leads to feelings of loneliness, ultimately having a detrimental influence on the psychological health of the elderly.[1]Depression among the elderly is not uncommon but often remains undetected and thereby untreated[3] and most of the time people think that depression is a normal part of aging and a natural reaction to chronic illness[4].

The elderly constitute a vulnerable group as they suffer from physical, economic, social and nutritional problems[3]. Depression being difficult to diagnose, will lead to an increase in morbidity, mortality and health care costs along with a reduction in quality of life[5]. Elderly patients with depression are more prone for cardiovascular, lung diseases and are less likely to adhere to their diet, exercise and medications[2]. Depression is projected to become the second-leading cause of disease burden after Ischemic Heart Disease by 2020 [6].

To address this issue we first have to know the burden of the disease and risk factors leading to depression in elderly. There are only few studies done especially in this region of Karnataka. Hence this study was undertaken to know the prevalence of depression among elderly and to know the factors leading to depression.

MATERIAL AND METHODS

A Community based Cross-Sectional study was conducted in Rural and Urban field Practice area, Department of Community Medicine, Kanachur Institute Of Medical Sciences, Mangalore.

STUDY POPULATION: All Geriatric population above the age of 60 years in the study area. Individuals above the age of 60 years residing in old age homes, critically ill and unable to comprehend and respond were excluded from the study.

SAMPLE SIZE: Using the formula, $S=4pq/d^2$, (taking p as 45.90%[7]and d as 20% of p) a sample size of 125 was calculated which also included a non response rate of 5%.

METHODOLGY FOR DATA COLLECTION: Institutional Ethical Approval was taken prior to conducting the study. Elderly are people above 60 years of age.In the study area defined, a house to house survey was done. Using simple random sampling, 125 subjects were enrolled for the study. Written informed consent for the study was taken from all the participants.

TOOLS FOR DATA COLLECTION: Socio demographic characteristics like Socio-economic status, Educational history, Environmental history, Marital history were collected by a pretested performa . Socio-economic status was assessed using Modified B G Prasad's classification.

Geriatric Depression Scale (GDS) is a widely used Screening instrument for depressive symptoms in elderly. GDS 15 is a brief questionnaire that consists of 15 questions which are answered Yes or No. Of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Elderly who scored ≥5 was considered to be depressed.[8]

The Short Form is more easily used by physically ill and mildly to moderately demented patients who have short attention spans and/or feel easily fatigued. It takes about 5 to 7 minutes to complete.[8]

STATISTICS: The data was collected, coded and compiled in Excel sheet and statistical analysis was done using IBM SPSS software version 25 . Descriptive statistics were presented as Mean and standard deviation for continuous variables and as frequency, percentage for categorical variables. Chi square test was used to study the association between different variables and magnitude of depression. P value<0.05 was considered as statistically significant.

RESULTS

Of the 125, 71.2% of the study population belonged to the age group of 60-70 years, 77 (61.6%) were Female participants, 72 (57.6%) had primary education and 41 (32.8%) were illiterate, 64 (51.2%) reside in Urban area and 61 (48.8%) in Rural area.78 (62.4%) are living in a Nuclear family and40 (32%) belonged to Class 3 Socio-economic status.(Table I)

Amongst the 125 participants, 59 (47.2%) had Depression. Depression was found to be more among the Females (53.25%) and those who had no education or up

TABLE I: Socio demographic features of the study participants

Age (in years)	Number (N=125)	Percentage (%)
60-70	89	71.2
71-80	32	25.6
>80	4	3.2
Sex		
Male	48	38.4
Female	77	61.6
Place		
Rural	61	48.8
Urban	64	51.2
Marital status		
Unmarried	2	1.6
Married	88	70.4
Widow	33	26.4
Separated	2	1.6
Education		
Illiterate	41	32.8
Primary schooling	72	57.6
High school	6	4.8
Pre-university	5	4
Graduate	1	0.8
Type of family		
Nuclear	78	62.4
Three generation	39	31.2
Joint	8	6.4
Socio-economic status		
Class I	15	12
Class II	35	28
Class III	40	32
Class IV	29	23.2
Class V	6	4.8

TABLE II: Association between Depression and Socio-demographic variables

Socio-demographic characteristic		Depression absent, n (%)	Depression present, n (%)	Chi square value, p value
Sex	Male	30 (72.5)	18 (27.5)	2.941 , 0.086
	Female	36 (46.75)	41 (53.25)	
Education	Primary and below	56 (49.56)	57 (50.44)	4.965 , 0.2585
	High school and above	10 (83.33)	2 (16.67)	
Address	Rural	34 (55.73)	27 (44.26)	0.412, 0.52
	Urban	32 (50)	32 (50)	
Type of Family	Nuclear	58 (49.57)	59 (50.42)	4.315, 0.037
	Three generation and Joint family	7 (87.5)	1 (12.5)	

*P value <0.05 is considered statistically significant

TABLE III: Association between depression and medical status of study participants

Characteristics	Depression Absent	Depression Present	Chi square value, p value
Are you suffering from any ailment? (Yes)	33 (46.48)	38 (53.52)	2.635, 0.104
Are you suffering from any physical disability? (Yes)	11(47.83)	12 (52.17)	0.279, 0.596
Have you ever met with an accident? (Yes)	11(55)	19(63.33)	0.046, 0.829
Drug/alcohol/smoking/ tobacco usage (Yes)	18(69.23)	8(30.77)	4.610,0.3178

*P value <0.05 is considered statistically significant

TABLE IV: Association between depression and socio economic status of study participants

Characteristics	Depression Absent	Depression Present	Chi square value, p value
Are you facing any occupational problems? (Yes)	3(50)	3(50)	0.0198, 0.88
Are you paying any interest against any kind of loan? (Yes)	5(20)	20(80)	11.11, <0.001
Are you receiving any kind of pension (No)	46 (45.5)	55 (54.5)	10.559, 0.001
Are you satisfied with your children's job?(No)	7 (22.5)	24 (77.5)	14.876,.00011

*P value <0.05 is considered statistically significant

to primary (50.44%). However on application of Chi square test, there was no statistically significant association of depression with these socio-demographic variables. Elderly those who lived in a Nuclear Family and three generation (50.42%) were more depressed compared to those living in joint family and was statistically significant (p value =0.037). (Table II)

Depression in elderly was associated with paying interest against loans (80%, P value<0.001), not receiving any kind of Pension (54.5% , P value= 0.001), not being satisfied with their Children's job (77.5%, P value=0.00011), not being satisfied with the relationship towards their Family (58% , P value=0.00049) and Children not obeying them (82.5%, P value=0.00049). Amongst the Depressed, 60% of them found difficulty in making decisions (P value=0.007), 64.3% of them refrained themselves from hanging out with their friends (P value <0.001) and 78.43% of them often felt helpless (P value=0.00001).(Table III, IV,V)

DISCUSSION

In this study 47.2% elderly had Depression. The prevalence of depression in females (53.25%) was more when compared to that of males (27.5%). Similar finding was observed in a study conducted by Poonam Ramesh Naik et al[3], where the prevalence of depression was more among elderly females (62.7%). Family responsibilities and burden contributes to increased perception of mental stress on them. However there was no statistically significant association of gender with depression.

TABLE V: Association between depression and relationship of study participants with family and friends

Characteristics	Depression Absent	Depression Present	Chi square value, p value
Is it easy for you to make decisions? (No)	24 (40)	36 (60)	7.039, 0.007
Do you like to hangout with your friends? (No)	25 (35.7)	45 (64.3)	18.635, <0.001
Do you feel helpless/Do you think you can rely on someone in such situations? (Yes)	11(21.57)	40(78.43)	83. 7174,.00001
Are you satisfied with your relationship towards family? (No)	11 (42)	15 (58)	1.332,.00049
Do your children obey you? (No)	3 (17.5)	16 (82.5)	12.133,.00049
Have you lost any family member/child in past 1 year? (Yes)	4(26.67)	11(73.33)	4.671,.30674

*P value <0.05 is considered statistically significant

According to our study, 73.33% were depressed due to loss of one of their family members in the last one year. This was similar to the study done by Mayur SS et al[2], in which the elderly who had lost their spouse (57.81%) were suffering from higher rate of depression. Irreparable psychological negative impact can be caused in those who have lost their spouse and make them more vulnerable to depression. However there was no statistically significant association of this with depression.

Depression is higher among those elderly people who worry a lot about their past (55%) and who feels helpless (78.43%) most of the time, according to our study. In contrast to this, the study done by Ganguli M[9] et al showed that depression among elderly who feel often helpless was 36.3% and depressed due to their past was 33.3%.

In our study most of the depressed subjects are those who lack social participation (25.45%). Similarly it was seen that 44.32% lacked social participation in a study conducted by Rajkumar A P et al[7]. This can lead to feeling of loneliness and emptiness which eventually makes them depressed. This had statistically significant association with depression.

In our study, most of the elderly people were not satisfied with the relationship towards their family (44.4%) and were depressed of their children's behavior (40.78%) due to which they are not getting more emotional support which is required to face the challenges caused by physiological and psychological stressors.

CONCLUSION: According to our study, the prevalence of depression in geriatrics is significantly high with every other elderly is suffering from depression. The very nature of depression interferes with the ability of a person to seek help, draining energy, loss of interest in life and self-esteem. The physical, social and psychological health of the geriatrics have to be monitored . Education should be given at individual, community and the national level about how to combat depression. Quality health care of the elderly is necessary to reduce the future burden of diseases and disabilities. Health care services should introduce Geriatric clinics. Support through counseling should be done in those who are isolated and vulnerable for developing depression.

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Assessment of Indian diabetes risk score as a tool for identifying diabetes among urban residents

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ABSTRACT

Background: Indian Diabetes Risk Score [IDRS] by Madras Diabetic Research Foundation was approved as screening tool in National programme for prevention and control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS). This study was planned to test the utility of IDRS in screening diabetes among urban population. **Methods:** This cross-sectional study was conducted among 625 individuals residing in urban wards of Rajahmundry in 2013-14. Data was collected on socio-demographic variables, anthropometric measurements followed by testing for fasting blood sugars to diagnose diabetes. Area under receiver operating characteristic curve was calculated for presence of diabetes. **Results:** In the present study 49.92% population had high risk score (≥60) for diabetes. The prevalence of diabetes in our study was about 15.4%, and pre-diabetes was 4.5 % (total 19.9%). It was observed that obesity among females was 43.36%, among males it was 31.52%. In this study IDRS >60 had the sensitivity of 79.17% and specificity of 50.0%. IDRS >60 not only diagnoses diabetes also identifies coronary artery disease. In the community it also helps to identify metabolic syndrome.

Conclusions: IDRS is a useful screening tool for early diagnosis diabetes and initiation of appropriate lifestyle interventions to prevent various complications of diabetes mellitus.

Key Words: Diabetes mellitus, Indian Diabetes Risk Score, urban adults, Andhra Pradesh

INTRODUCTION

Diabetes Mellitus is the most common non communicable disease globally with more than 424.9 million people.[1] China having highest burden of diabetes with 114.4 million, India is in second position with 72.9 million.[2] India is expected to emerge as a global leader in diabetes mellitus by the year 2045. Even though India is having huge burden of diabetes in the world, most of them remain undiagnosed.[3] Early detection is critical for moderating the health and economic impacts of the disease. It is neither feasible nor cost effective to perform universal screening for type 2 diabetes using blood sugar estimations to cover the whole population. Targeted screening with a non-invasive test for initial selection of subjects followed by plasma glucose testing in high risk individuals only is a more efficient approach.[3] Assessment of risk of undiagnosed type 2 diabetes is commonly used to identify individuals who need to be recommended for further biochemical testing.

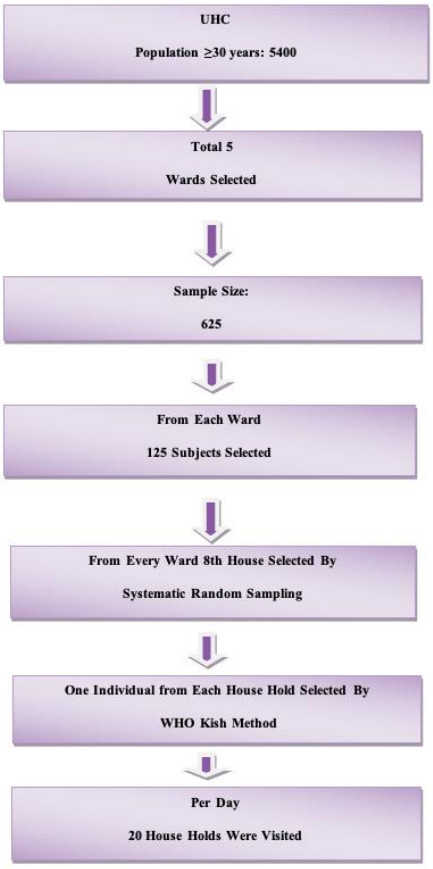
Diabetes is not only disease of affluence now it is increasing in slum areas. The increasing risk factors are like taking junk foods, high calorie and high cholesterol diets, sedentary life styles, smoking and alcohol habits.[4] This vulnerable population because of unawareness, inaccessibility to health care, health seeking behaviour also less among urban slums need interventions that are cost effective, feasible for screening and detection of diabetes and early signs of complications.[5] To detect millions of Indians by Indian Diabetes Risk Score [IDRS], which is cost effective, feasible, non-invasive and non bio-chemical Madras Diabetic Research Foundation was approved by Government of India and utilised as screening tool in National programme for prevention and control of cancer, Diabetes, Cardiovascular Diseases and stroke (NPCDCS).[6] Keeping in view of afore mentioned facts, study was carried out in the urban health centre area of a Medical College to test the utility of Indian diabetic risk score in screening diabetes among urban population.

MATERIAL AND METHODS

This study was commenced after institutional ethical committee approval. Written informed consent was obtained from respondents. The study was conducted at urban wards of Rajahmundry city in Andhra Pradesh, over a period of one year. The prevalence of known diabetes in urban areas according to ICMR is around 14-20%. The prevalence of type-2 diabetes in these areas is 13.5% at 95% confidence interval with 80% power, the expected sample size required to estimate the prevalence of diabetes was 625. The type of probability sampling adopted for this study is multistage sampling technique for selecting wards and households (Figure 1).

Data collection was done using a pretested questionnaire containing details of socio-demographic profile (Age, sex, income, education, occupation, and religion), anthropometric variables (height, weight, waist circumference and clinical details for each study participant, risk was assessed using an IDRS scoring. Fasting capillary blood glucose was determined using the glucose meter (One Touch Ultra, Life scan Johnson & Johnson) to those subjects with IDRS score >60. According to ADA guidelines fasting capillary blood >126 is diagnostic of diabetes. ADA recommended use of fasting blood glucose alone for diagnosis in epidemiological studies as well as in clinical diagnosis except in pregnant.[7] All newly diagnosed diabetic subjects were asked to confirm their diabetes with a venous OGTT or repeat plasma glucose values at the local urban health centre or at a government hospital.

Figure 1. PROCEDURE OF CONDUCTION OF STUDY



Definitions:

Diabetes: Diabetes was defined by physician diagnosis of diabetes and current use of medications for diabetes (insulin or oral hypoglycaemic agents) and/or fulfilment of criteria laid down by the WHO Consultation Group Report, i.e., capillary fasting blood glucose ≥126 mg/dl or 2 h capillary post-glucose value ≥220 mg/dl.[8]

Impaired Fasting Glucose: Impaired fasting glucose was defined based on WHO criteria, i.e., if fasting capillary blood glucose ≥110 and <126 mg/dl.[8]

Impaired Glucose Tolerance: Impaired glucose tolerance was defined according to WHO criteria where 2hr capillary post-glucose value is ≥160 but <220 mg/dl with a fasting value in the non diabetic range. All data collected were stored electronically. All statistical analyses were performed by using SPSS Software version-21 for Windows, MedCalc. Version 12.7.3.0. Software for Windows and Ms-excel 2007. Values were presented as Mean ± SD and in percentages. Chi-square tests were used for examining the association of categorical variables. Binary logistic regression was used for predicting the diabetes. For all statistical analyses $p<0.05$ was considered statistically significant. ROC curves were drawn for validating IDRS Scores.

RESULTS

Table-1: Descriptive Statistics of the Baseline characteristics (N=625)

Study Variables	Min.	Max.	Mean	Std. Deviation
Age	30	80	42.85±10.57	10.57
S.BP.	93	231	136.97±23.92	23.92
D.BP	60	211	86.99±17.76	17.76
Height	135	178	155.95±9.20	9.2
Weight	47	102	66.14±9.06	9.06
Waist	65	124	89.66±8.85	8.85
Hip	78	140	102.56±10.89	10.89
Waist/Hip Ratio	0.66	1.13	0.87± 0.06	0.065
IDRS Age	0	30	17.23±10.88	10.88
IDRS Abdominal Obesity	0	20	10.54±7.80	7.8
Physical Activity	0	30	20.85±8.47	8.47
IDRS Family History	0	20	4.11±7.19	7.19
IDRS Total	0	100	52.74±18.38	18.38
BMI	19.1	43.37	27.27±3.72	3.72
Cooking Oil Usage Kgs/Month	1	10	4.09±1.49	1.49
Cooking Oil Usage Per Person	0.3	2	0.85±.331	0.331
FBS	59	162	103.6±25.77	25.77

We collected data among 625 subjects residing at field practise area of urban health centre Socio-demographic, anthropometric data collected for all the subjects and fasting blood sugar test conducted for the subjects with

Table-2: Cross tabulation between BMI & Sex, IDRS Abdominal Obesity (N=625)

Sex			Total	IDRS Abdominal Obesity Score			Total	P Value
	Female No. (%)	Male No. (%)	No. (%)	0	10	20	No. (%)	
Normal Weight	27 (50.94)	26 (49.06)	53 -8.48	21 (39.62)	20 (37.74)	12 (22.64)	53 (8.48)	
Over Weight	56 (53.85)	48 (46.15)	104 (16.64)	29 (27.88)	49 (47.12)	26 (25)	104 (16.64)	
Obese	271 (57.91)	197 (42.09)	468 (74.88)	124 (26.50)	174 (37.18)	170 (36.32)	468 (74.88)	0.035
Total	354 (56.64)	271 (43.36)	625 (100)	174 (27.84)	243 (38.88)	208 (33.28)	625 (100)	

Table-3: Cross Tabulation between IDRS Total & FBS (n=312)

FBS		IDRS Total		Total	P-Value
		<60 (N(%))	≥60 (N(%))	(N(%))	
Group	<126	5 (17.86)	23 (82.14)	28 (22.58)	0
	≥126	-	96 (100)	96 (77.42)	
Total		5 (4.03)	119 (95.97)	124	

Table-4: Correlations between IDRS Abdominal Obesity & FBS (n=312)

Study Variables		IDRS Abdominal Obesity	FBS
IDRS Abdominal Obesity	Pearson Correlation	1	0.142*
	Significance (2-tailed)	-	0.012
FBS	Pearson Correlation	0.142*	1
	Significance (2-tailed)	0.012	-

*Correlation is significant at the 0.05 level (2-tailed)

with IDRS total >60 (n=312). It was observed that among 312 subjects, 96 of them got fasting blood sugar >126mg/dl.

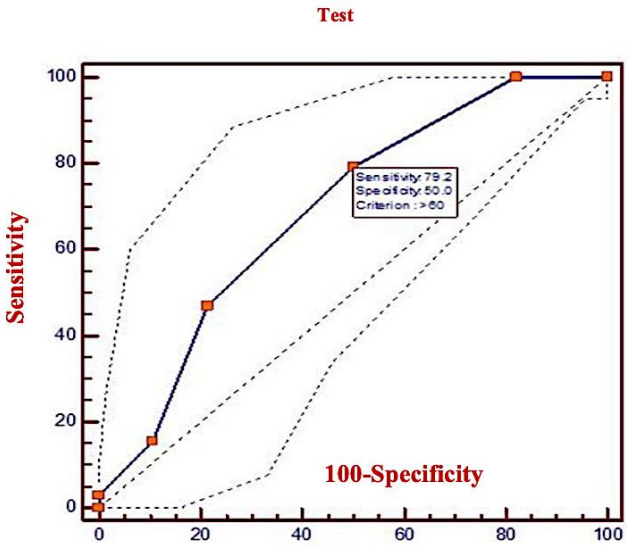
Descriptive statistics of continuous variables shows mean age of participants in this study is 42.85±10.574, mean systolic BP of the participants is 136.97 ± 23.929, mean diastolic BP is 86.99±17.762, mean weight is 66.14±9.062 which are in the hypertensive range and obese ranges. Mean IDRS total in this study is 52.74% nearer to mainly pre diabetic range. Mean cooking oil usage per person is 0.8597 kg which is higher than recommended daily usage per person i.e., 0.5 kg per person per month. Mean waist and waist hip ratios are showing on higher ranges. (Table 1)

Table-5: Linear Regression between IDRS Abdominal Obesity & FBS (n=312)

Model	Unstandardized Coefficients		Standardized Coefficients		Signifi-cance
	B	Std. Error	Beta	t	
(Constant)	97.743	2.76	-	35.409	0
IDRS Abdominal Obesity	0.482	0.191	0.142	2.531	0.012

a. Dependent Variable: FBS

Fig-2 ROC Curve for IDRS ≥60



Both over weight and obesity is seen more among females compared to males. Statistical significance (p=0.035) is seen between BMI and IDRS abdominal obesity. Abdominal obesity is dependent on BMI. (Table 2)

Interpretation: Chi square test applied between two categorical variables such as FBS (FBS categorised into <126 and > 126 as two groups) and IDRS (IDRS into two

groups <60 and > 60). Test shows IDRS scores are statistically significant (p<0.05 i.e., p=0.000) from fasting blood sugar. (Table 3) From Table 4 it is clear that there is statistical significant (p=0.012) positive correlation between IDRS abdominal obesity and fasting blood sugars.

From Table 5 prediction model also it is clear that fasting blood sugar dependent on IDRS abdominal obesity and which is statistically significant (p=0.000). From all the five tables it is clear that through Chi-square test, correlation, and through regression model IDRS abdominal obesity is a powerful predictor of diabetes. Statistical significance observed in these three tests.

Validation:

ROC curves were constructed to identify the optimum value (>60%) of IDRS for determining diabetes as diagnosed using WHO consulting group criteria. Sensitivity, specificity, positive and negative predictive values and accuracy for predicting undiagnosed diabetes were calculated for different cut off scores ROC's were obtained for IDRS and tested for newly diagnosed diabetes diagnosed using WHO criteria.

The AUC for the ROC was 0.690 (95% Confidence interval 0.601 to 0.770) with significant P value (0.0016). IDRS is valid tool for predicting diabetes.

DISCUSSION

In this study we used a simplified Indian Diabetes Risk Score for risk assessment and identifying newly diagnosed diabetic subjects in the field practise area of medical college. Further, use of such a risk score would be of great help in developing countries like India especially in urban slums[9] where there is a marked explosion of diabetes and over half of the cases remain undiagnosed. In the present study 49.92% population had high risk score (≥60) for diabetes. In a similar study[7] conducted at Chennai by Mohan et al., 43% of the population were found in high risk category to be screened with IDRS score of ≥ 60 has 72.5% sensitivity and 60.1%specificity. Another study done by Sanjay Kumar Gupta et al[10], in urban Pondicherry had 31.2% high risk subjects. This risk difference may be due to variance in life-styles of the population. Our study was done in a urban slum area, whereas Mohan et al[6], conducted the study in a metropolitan city and another study was in the urban area of Pondicherry. In Boloor diabetic study[11]by Prabha Adhikari et al 29.7% had high risk score ≥60. The prevalence of diabetes in our study is about 15.4%, and pre-diabetes is 4.5 %(total 19.9%), whereas PODIS study[9] showed 18.6% in Chennai which is a metropolitan city with affluent lifestyle.

Obesity is a potent risk factor for diabetes; in this study it is observed that obesity among females is 43.36%, among males it is 31.52%. Overweight among females is 8.96% and among males is 7.68%. Banerji et al[12], Dickinson et al[13], showed that several cross-sectional epidemiological studies suggest that obesity and abdominal obesity are strongly linked to diabetes. Sanjay kumargupta et al[10],in their study showed 39.64% are overweight, 40% are obese in Kerala which is similar to this study. Now even at low thresholds for conventional risk factors for Asian Indians.[14]

According to Eberhart, Ogden et al.[15] Approximately 55% cases of type 2 diabetes are due to obesity. Chronic obesity ultimately leads to increased insulin resistance,[16] which can develop into type 2 diabetes, because of adipose tissue (mostly that in the stomach around internal organs) is a passive source of several hormones, cytokines and chemical signals , to other tissues. Anjana et al.[17] It was found that diabetic subjects had significantly higher visceral fat (measured by CT) and central abdominal fat (measured by DEXA) compared to non-diabetic subjects, abdominal fat was significantly greater in the diabetic group. Abdominal adiposity assessed using waist circumference is considered to be more appropriate than generalised adiposity assessed by BMI by Gundurao et al.[18]

In this study screening of study population done by Indian Diabetic Risk Score developed by V Mohan et al.,(MDRF)[6]which was approved by Government of India and using in NPCDCS. The MDRF – IDRS is easy to administer and tabulate and its accuracy makes it a useful screening test for diabetes with simple four questions and one anthropometric measurement namely waist circumference.

In this study IDRS >60 has the sensitivity of 79.17% and specificity of 50.0%, in Boloor study by Prabha Adhikari et al[11], in southern part of India with sensitivity 62.2% and specificity of 73.7% and in their study they took 20 years and above as age limit. In a similar study[6]conducted at Chennai by Mohan et al., 43% of the population were found in high risk category to be screened with IDRS score of ≥ 60 has 72.5% sensitivity and 60.1%specificity.

IDRS >60 not only diagnoses diabetes also identifies[19] coronary artery disease, diabetic peripheral neuropathy, peripheral vascular disease. In the community it also helps to identify[20, 21] metabolic syndrome. IDRS can be used as tool not only for diagnosing it is a valid motivational tool[22] for life style change. This IDRS tool validated at 5 places namely Andhra Pradesh, Boloor, Madras, Pondicherry, and Vellore.

There are two steps involved in cost effective screening for diabetes at the community level. Use of Indian Diabetic Risk Score is the first step to identify persons at high risk for diabetes. Step two involves use of blood test, such as random capillary blood glucose or fasting blood sugar to further narrow validation. The validated IDRS has been successfully implemented as a practical screening tool to assess the diabetes risk and to detect undiagnosed type 2 diabetes. Moreover, it also proved suitable in prediction of metabolic syndrome and cardiovascular disease in the South Indian population. Further confirmation with GTT is required among subjects with IDRS >60 to detect early, the occurrence of diabetes. We therefore recommend that all those with FBS ≥100 mg/dl at initial screening to undergo definitive testing by OGTT as this will help to pick up everyone with any glucose intolerance, i.e., diabetes, IGT or IFG.

Besides this, lifestyle and dietary modification are to be initiated to reverse the risk factors among these people.

The limitations of our study were, use of capillary blood glucose estimation instead of venous glucose estimation, which would have been ideal. More number of female participants than male subjects in this study. The proportion of females (56%) was higher than males (44%). Men in this area are working in Municipal Corporation as drain cleaners and sweepers and they go early in the morning and come late in the evening.

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Prenatal exposure to indoor air pollution and the risk of Low Birth Weight: A case-control study in a rural maternity hospital in Ramanagara district, Karnataka

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ABSTRACT

Background: In India, according to National Family Health Survey 4, the incidence of low birth weight was 18%. One of the factors that has emerged as a risk factor for low birth weight (LBW) is indoor air pollution. **Objectives**: To estimate the risk of low birth weight with prenatal exposure to indoor air pollution, in a rural area of south Karnataka. **Study design**: Case-control study. **Study setting**: The study was conducted in a Maternity hospital in a rural area of Ramnagara District in south Karnataka for two months. **Participants**: Women who delivered live singleton infants with LBW (birth weight < 2500g irrespective of gestational age) were considered "Cases". "Controls" included women who delivered single live infants weighing ≥ 2500g. **Methods**: Subjects were administered a pre-tested, face-validated structured questionnaire, with socio-demographic and obstetric information, exposure to various sources of indoor air pollution as well as environmental factors contributing to indoor air pollution. **Main outcome measures**: Odds ratio and adjusted odds ratio for various sociodemographic and environmental factors contributing to LBW. **Results**: Absence of exhaust ventilation in the kitchen, OR=3.76 (1.09-13.03), regular use of incense, OR=4.94 (1.12-21.73) and lack of cross ventilation in the house, OR=4.65 (1.60-13.51) were identified to be the main risk factors associated with LBW. **Conclusions**: Prenatal exposure to indoor air pollution carried a higher risk of LBW. Pregnant women need to be educated regarding the harmful effects of burning incense at home and the dangers of poor ventilation, and their effect on the birth weight of newborns.

Key Words: Incense, smoke, ventilation, low birth weight, indoor air pollution.

INTRODUCTION

Low birth weight (LBW) is defined as a weight of less than 2500 grams irrespective of gestational age [1]. Globally, in 2013, the incidence of low birth weight was 16% [2]. In India, according to National Family Health Survey 4 (NFHS-4), the incidence of low birth weight was 18% [3].

There are multiple established risk factors contributing to low birth weight such as extremes of maternal age, anaemia during pregnancy, maternal diet, previous miscarriages, gestational hypertension, antenatal infections and psychosocial stress [4]. Even though studies have been able to identify many causes of low birth weight, the incidence of LBW babies is still disturbingly high in developing nations like India, especially since the chances of survival of LBW children are lower compared to normal birth weight children.

One of the factors that has emerged as a risk factor for LBW is indoor air pollution. Indoor air pollution can be described as the decrease in air quality indoors due to harmful chemicals [5]. The main contributors are combustion of biomass fuel, environmental tobacco smoke, bioaerosols and building materials [6]. Globally, 41% of households, mainly in developing countries in Asia and sub-Saharan Africa rely on solid fuels (coal and biomass) as their primary cooking fuel [7]. These emit a variety of pollutants including fine particles, CO, and nitrogen oxides as well as phenols, cresols, acrolein, and acetaldehyde; carcinogenic organic compounds such as benzene, formaldehyde, and 1,3 butadiene; and carcinogenic cyclic compounds such as polyaromatic hydrocarbons which are very harmful for health [8].

Tobacco smoke from people smoking inside the house is also an indoor air pollutant. Environmental tobacco smoke (ETS) is a combination of side-stream smoke that is emitted from the burning end of a cigarette and the mainstream smoke exhaled by the smoker. Side-stream smoke constitutes about 85% of the smoke present in a room and is considered more toxic than the mainstream smoke [9]. A meta-analysis shows that pregnant women who reported exposure to ETS has a higher risk of

delivering LBW and/or small for gestational age babies [10]. Another important contributing factor to LBW is smoking during pregnancy. Nicotine and carbon monoxide are major constituents of tobacco smoke and smoking during pregnancy can lead to birth weights of 200 g less than the mean birth weight of children of non-smokers [10].

The various other sources of indoor air pollution include paints, adhesives, solvents, pressed wood, household pesticides including insect sprays, deodorizers and burning of incense and mosquito coils [11]. These are the sources of various Volatile Organic Compounds (VOCs) including aromatic and aliphatic hydrocarbons, halogenated hydrocarbons, acetone, 2 – butanone and freons [12] which if present in harmful amounts can adversely affect the growth of the foetus.

Antenatal women are at increased risk for adverse outcomes from indoor air pollution due to large amount of time they spend at home. There are very few studies connecting low birth weight with various types of indoor air pollution, especially in rural areas of India. Therefore, this study was conducted with the aim of estimating the risk of low birth weight with prenatal exposure to indoor air pollution, in a rural area of south Karnataka.

MATERIAL AND METHODS

An unmatched case control study was conducted in a maternity hospital in a rural area of Ramnagara District in south Karnataka among women who delivered there during the period of September to October 2017, after receiving Institutional Ethics Committee approval and permission from the hospital authorities. Eligible participants were women who: (1) delivered a live singleton foetus; (2) delivered in the hospital (3) were residents of the mentioned study area for at least one year before delivery.

Women who delivered live singleton infants with low birth weight (birth weight less than 2500g irrespective of gestational age) were considered "Cases". "Controls" included women who delivered single live infants weighing ≥ 2500g. Data on the newborn was collected from the hospital records. After identifying the cases and controls, written informed consent was obtained and the subjects were administered a pre-tested, face-validated structured questionnaire, translated into the local language Kannada, which comprised socio-demographic and obstetric information, exposure to various sources of indoor air pollution as well as environmental factors contributing to indoor air pollution.

Sample size was calculated to be 28 cases based on a previous study [13]. It was decided to include two controls for every case.

Statistical analysis: The data obtained was entered into Microsoft excel and analysed using SPSS v20. Frequencies, proportions, mean with standard deviation and median with interquartile range were used for descriptive statistics. To compare various variables between cases and controls, independent T test, Mann-Whitney U test and Kruskall Wallis test were used. Odds ratios with 95% confidence intervals were used to associate LBW with various sources of indoor air pollution. Significantly associated variables were entered into a multivariate logistic regression model to derive adjusted odds ratio.

RESULTS

Table 1: Sociodemographic details of cases and controls

Variable	Category	Cases (30)	Controls (60)	p value
Age (in years)	Mean (SD)	22.57 (2.89)	23.52 (3.56)	0.245$
Educational status	Up-to high School	20(66.7)	17(28.3)	0.000*
	Higher secondary and above	10(33.3)	43(71.7)	
Occupation	Housewife	27(90.0)	53(88.3)	1.000#
	Employed	3(10.0)	7(11.7)	
Monthly per capita income (INR)	Median (IQR)	2366 (1000-3333)	2583 (1525 – 3333)	0.380$
Type of family	Nuclear	13(43.3)	15(25.0)	0.077
	Others	17(56.7)	45(75.0)	

*p value <0.05; statistically significant, # Fisher's exact test, $ Mann-Whitney U test

Table 2: Obstetric details of cases and controls

Variable	Category	Cases (30)	Controls (60)	p value
Gestational age at delivery (weeks)	Mean (SD)	38.2 (1.7)	38.7 (1.0)	0.387$
Parity	1	26(86.7)	40(66.7)	0.127#
	2	3(10.0)	14(23.3)	
	3 or more	1(3.3)	6(10.0)	
Haemoglobin (g/dL)	Mean (SD)	11.07 (2.19)	11.38 (1.39)	0.938$
Number of antenatal ultrasound scans	Median (IQR)	4 (3-4)	4 (3-4)	0.128$
Mode of delivery	Normal	28(93.4)	51(85.0)	0.680#
	LSCS	1(3.3)	4(6.7)	
	Assisted	1(3.3)	5(8.3)	
Gender of newborn	Male	17(56.7)	30(50.0)	0.551
	Female	13(43.3)	30(50.0)	

*p value <0.05; statistically significant, # Fisher's exact test, $ Mann-Whitney U test

A total of 30 cases and 60 controls in the ratio of 1:2 were included in the study. There was no significant difference between the cases and controls with regards to possible confounding socio-demographic variables like age, education, occupation, per capita monthly income, age at marriage, or type of family. *see table 1.* There was no significant difference between the cases and controls with regards to obstetric variables like gestational age at

Table 3: Indoor air pollutants and the risk of low birth weight.

Variable	Category	Cases (30)	Controls (60)	Odds Ratio	95% Confidence Interval		p value
Exposure to second hand smoke at home	Yes	7(23.3)	11(18.3)	1.35	0.46	3.95	0.576
	No	23(76.7)	49(81.7)				
Exposure to smoke producing cooking fuel	Yes	5(16.7)	15(25.0)	0.6	0.19	1.84	0.37
	No	25(83.3)	45(75.0)				
Regular use of mosquito coils	Yes	11(36.7)	13(21.7)	2.09	0.79	5.48	0.129
	No	19(63.3)	47(78.3)				
Regular use of Incense	Yes	27(90.0)	40(66.7)	4.5	1.21	16.64	0.017*
	No	3(10.0)	20(33.3)				
Regular use of insect spray	Yes	7(23.3)	9(15.0)	1.72	0.57	5.2	0.33
	No	23(76.7)	51(85.0)				
Regular use of air freshener	Yes	3(10.0)	6(10.0)	1	0.23	4.31	1.000#
	No	27(90.0)	54(90.0)				

*p value <0.05; statistically significant, # Fisher's exact test

Table 4: Environmental factors contributing to indoor air pollution and the risk of low birth weight

Variable	Category	Cases (30)	Controls (60)	Odds Ratio	95% Confidence Interval		p value
Separate kitchen	Absent	3(10.0)	5(8.3)	1.22	0.27	5.49	1.000#
	Present	27(90.0)	55(91.7)				
Exhaust Ventilation in the kitchen	Absent	25(83.3)	34(56.7)	3.82	1.28	11.34	0.012*
	Present	5(16.7)	26(43.3)				
Presence of soot on kitchen wall	Present	4(13.3)	4(6.7)	2.15	0.49	9.29	0.433#
	Absent	26(86.7)	56(93.3)				
Cross Ventilation	Absent	22(73.3)	22(36.7)	4.75	1.81	12.46	0.001*
	Present	8(26.7)	38(63.3)				
Windows (most of the day)	Closed	14(46.7)	13(21.7)	3.16	1.23	8.13	0.015*
	Open	16(53.3)	47(78.3)				
Overcrowding	Present	5(16.7)	9(15.0)	1.13	0.34	3.73	1.000#
	Absent	25(83.3)	51(85.0)				

*p value <0.05; statistically significant, # Fisher's exact test

Table 5: Adjusted factors for LBW: Multivariate logistic regression

Variable	Category	Adjusted Odds ratio	95% CI for Odds Ratio		p value
Exhaust ventilation	Absent	3.76	1.09	13.03	0.037*
Regular use of Incense	Present	4.94	1.12	21.73	0.034*
Cross ventilation	Absent	4.65	1.6	13.51	0.005*

*p value <0.05; statistically significant

delivery, parity, mean haemoglobin level (latest third trimester value), number of antenatal ultrasound scans, mode of delivery and gender of the newborn. *See table 2*. The mean (SD) birthweight among neonates born to women in the case group was 2.16 (0.26) kgs, while that in controls was 2.86 (0.28) kgs.

Among various sources of indoor air pollution, regular use (on most days of the week) of incense (like *agarbhatti, dhoop, sambrani*) was found to be of significant risk for LBW. Regular use (on most days of the week) of mosquito coils, insect sprays and air fresheners as well as exposure to second hand smoke were found to have no significant risk for LBW. *See table 3.* Among environmental factors contributing to indoor air pollution, presence of exhaust ventilation in the kitchen, lack of cross ventilation and keeping windows closed for most of the day carried significant risk for LBW. The absence of a separate kitchen, use of smoke-producing cooking fuel (like firewood, biomass, kerosene), presence of soot on the kitchen wall and overcrowding in the house were found to have no significant risk of LBW. In the present study none of the mothers were smokers. *See table 4.*

When variables that were associated with significant risk of LBW were entered into a multivariate logistic regression model, factors which continued to be of significant risk for LBW were absence of exhaust ventilation in the kitchen, OR=3.76 (1.09-13.03), regular

use of incense, OR=4.94 (1.12-21.73) and lack of cross ventilation in the house, OR=4.65 (1.60-13.51). *See table 5.*

DISCUSSION

Exposure to air pollution during pregnancy may affect maternal respiratory or general health, which can result in impairment of uteroplacental and umbilical blood flow, transplacental glucose, and total insulin which are identified as the major determinants of foetal growth [14]. Particulate matter can reduce the maternal lung function and can also cause oxidative stress causing cell damage in the foetus. Carbon monoxide can combine with haemoglobin and cross the placenta. This can result in decreased oxygen and nutrient supply to foetal tissues [15]. The results from our study shows that LBW among newborns is associated with exposure to indoor air pollution during antenatal period. Socio-demographic factors like maternal age, education, occupation, per capita monthly income which have been linked to LBW [16] [17], and are therefore potential confounders, were not significantly different between the cases and controls in the present study. Known confounding obstetric factors like gestational age, parity, haemoglobin, gender of the baby [18] too were not significantly different between the cases and controls.

In the present study we found nearly five times greater risk of LBW with the regular burning of incense at home. The products from burning incense include harmful gases like carbon monoxide, sulphur dioxide and volatile organic compounds, such as benzene, toluene, and xylenes, as well as polycyclic aromatic hydrocarbons [19]. Previous studies have shown association between ambient air pollutants including sulphur dioxide, PM10, carbon monoxide, total suspended particles and low birth weight [20][21][22].

Our study also found nearly four times greater chance of LBW in the absence of exhaust ventilation and nearly five times greater chance of LBW with lack of cross ventilation. The lack of exhaust ventilation and cross ventilation leads to decreased air circulation and stagnation of air pollutants, which might have contributed to longer exposure of the mothers to indoor air pollution. A study in the US found that ventilation from keeping windows open at least half the day had decreased risk of low birth weight [23].

Studies have shown that wood-fuel smoke exposure during prenatal period has a negative effect on birthweight of newborns [13][24][25][26]. Prenatal exposure to biomass fuel has also been associated with increased risk of low birth weight in India as well as in Ethiopia and Peru [18][27][28][29]. But no such association was found in our study probably because of the decreased use of biofuels in rural areas of south Karnataka, and the more widespread use of gas (LPG), as similarly seen in a study conducted in central East India [30].

Exposure to environmental tobacco smoke (ETS) is a known risk factor for LBW. (28)(31)No such association was found in our study probably because of the low number of cigarette smokers in the home. This could be a result of increased awareness among the population with regards to hazards of smoking and exposure to second hand smoke. Studies have also shown that reduction of smoking in public places and work places also leads to a reduction of smoking in the home [32].

A study in the US found that women who reported regular or frequent usage of personal and household products such as, hairspray and insect spray had higher odds of term LBW [23]. In the present study however, there was no significantly greater risk of LBW among women who were regularly exposed to insect spray, or air fresheners. This was possibly due to the very small numbers of women reporting the use of insect sprays and air-fresheners in a rural setting.

Based on the findings in our study, it is recommended that pregnant women be educated during their antenatal visits regarding the harmful effects of burning incense at home and the dangers of poor ventilation, and their effect on the birth weight of newborns. These points can be reinforced by the ASHA worker during her home visits to pregnant women, where such practices can be observed and corrected.

Conclusion: This case-control study in a rural area of south Karnataka found that prenatal exposure to indoor air pollution carried a higher risk of low birth weight. Women who were exposed to regular burning of incense during pregnancy were nearly five times more likely to have a LBW baby. Absence of exhaust ventilation in the kitchen and lack of cross ventilation in the house, were also found to carry higher risk of LBW. It is recommended that pregnant women be educated regarding the harmful effects of burning incense at home and the dangers of poor ventilation, and their effect on the birth weight of newborns.

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Assessment and Comparison of Perception of Eye Donation and Some Aspects of Eye Health Care Among the Medical and Nursing Students : A Cross-sectional Comparative study in Uttarakhand State

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ABSTRACT

Background: For the avoidable blindness (curative and preventive blindness), there is a need for capacity building of young future health functionaries which can be achieved by collecting data about their percept for eye donation/healthcare. **Objective:** To assess and compare the percept of eye donation and some aspects of eye health care amongst nursing and medical students. **Material and methods:** The total 290 medical and 439 nursing students were studied in the present study and information was obtained using semi-structured questionnaire. **Results:** Of the total 290 medical and 439 nursing students respectively that was studied,the awareness about eye donation was 100% in medical and 93.6% in nursing with mass media (TV/newspaper) constituted the greatest source of information in 72.7% (nursing) and 75.9% (medical). **Conclusion:** The incorrect information for the ideal time of eye donation was given by 17.7% students and for the incorrect usage of donated eyes was given by 79.5% students.

Key Words: Perception, eye donation, students, eye health care.

INTRODUCTION

Corneal transplant first performed by Edward Zirm in 1905 is the most widely practiced and most successful clinical allografting. [1-4] The practice of corneal transplant has witnessed phenomenal advances owing to innovations in instrumentation, surgical techniques and perioperative care, resulting in improved outcomes and costeffectiveness.[5] Despite these developments, widespread use of corneal grafting remains hindered by the relative scarcity of donor corneas in both developed and developing countries. This has been attributed to the unwillingness of potential donors to pledge their eyes and to the failure of health care personnel to educate potential donors on the process of eye donation· [3,4,6-13]

The late Dr Muthiah started the very first eye bank in India and he successfully performed the first corneal transplant in 1948. [14] India has the world's largest corneal blind population so corneal donation is one of the major requirements in India [15]. In India, there is addition of 40000-50000 corneal blind persons every year. Restoration of their vision is possible only through transplantation of cornea from donated eyes. Currently, in India the collection is nearly 22 thousand eyes a year which are negligible to the requirement.[17]

As medical and nursing undergraduates are the future healthcare providers, their percept about eye health care and eye donation plays an important role in strengthening the existing eye health services at different infrastructure levels of school health, varied cadres of health care and teaching medical/educational institutions as well as supporting the ongoing hospital retrieval programme in superspeciality centres . The study was done to assess the socio-demographic profile of the medical and nursing students along with their percept about eye donation and some aspects of eye health care and also to find the relationship of some aspects of eye health care, awareness and willingness of eye donation amongst medical and nursing students.

MATERIAL AND METHODS

After taking instituonal ethical approval, the community based cross-sectional study was carried from November 2013 to April 2014 on amongst medical and nursing students. The medical students of different years along with interns posted in the department and nursing students of any cadre who were co-operative and available at the time of data collection were included in the study. The questionnaire include knowledge on the exact time of removal of cornea, usage of donated eyes, eligibility of

particular persons for eye donation on the basis of use of spectacles, existence of chronic diseases and some questions on eye health care aspects. Also, the questionnaire include willingness/unwillingness to donate eye and the reasons for doing so. Informed consent was obtained from all the individuals after explaining the purpose of the study. The medical students were MBBS students of different academic years studying in the Government Medical College, Haldwani, Uttarakhand.The information from medical students/interns was obtained by the investigator in the lecture hall through semi-structured questionnaire.The nursing students that were enrolled in the study were studying in three private nursing colleges of Haldwani Block, district Nainital i.e Pal college (n=146), Dronh college (n=152) and Nancy college (n=141). The investigator approached the nursing tutors in their respective colleges for the collection of filled questionnaires by the students. All of them were ready to participate in the study who were present on the day when the questionnaire was administered to them. Frequency tables was prepared and descriptive analysis was done in percentages and appropriate figures like bar diagram and radar chart has been made for data presentation in the study and inferential statistics using chi square test was carried out. Analysis was done with the help of MS excel and SPSS version 18. (IBM SPSS)

RESULTS.

Fig 1: Profile of Nursing Students, n=439

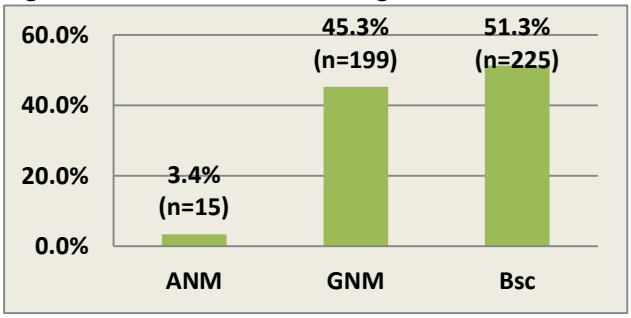

Fig 2: Profile of Medical Students, n= 290

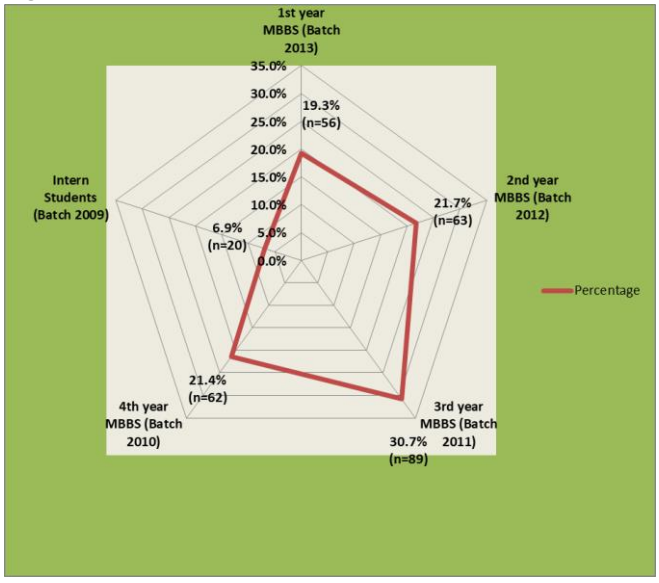

Table 1: Socio-demographic characteristics of the studied nursing and medical students

Socio-demographic characteristics	Nursing (n=439)	Medical (n=290)
Mean age in years (SD)	20.4 (± 3.02)	21.3 (± 2.02)
Sex	**Number (%) (n=439)**	**Number (%) (n=290)**
Male	23 (5.2%)	116 (40%)
Female	416 (94.8%)	174 (60%)
Religion	**Number (%) (n=439)**	**Number (%) (n=290)**
Hindu	403 (91.8%)	256 (88.3%)
Muslim	8 (1.8%)	30 (10.3%)
Sikh	19 (4.3%)	3 (1%)
Christian	9 (2.1%)	1 (0.3%)
Caste	**Number (%) (n=439)**	**Number (%) (n=290)**
General (others)	285 (64.9%)	210 (72.4%)
OBC	87 (19.8%)	48 (16.6%)
SC	48 (10.9%)	23 (7.9%)
ST	19 (4.3%)	9 (3.1%)
Education father	**Number *(%) (n=436)**	**Number# (%) (n=289)**
Not specified	92 (21.1%)	42 (14.5%)
Illiterate	2 (0.5%)	1 (0.3%)
< high school	10 (2.3%)	6 (2.1%)
High school	43 (9.9%)	6 (2.1%)
Intermediate	150 (34.4%)	28 (9.7%)
Graduate	107 (24.5%)	99 (34.3%)
Post graduate	22 (5%)	58 (20.1%)
Professional	10 (2.3%)	47 (16.3%)
Semiprofessional (1 nurse and 1 bachelor in pharmacy)	0	2 (0.7%)
Occupation father	**Number* (%) (n=436)**	**Number #(%) (n=289)**
Not specified	54 (12.4%)	19 (6.6%)
Government job	222 (50.9%)	194 (67.1%)
Private job	95 (21.8%)	52 (18%)
Farmer	65 (14.9%)	24 (8.3%)
Education mother	**Number** (%) (n=437)**	**Number (%) (n=290)**
Not specified	99 (22.7%)	72 (24.8%)
Illiterate	8 (1.8%)	12 (4.1%)
< high school	81 (18.5%)	14 (4.8%)
High school	108 (24.7%)	18 (6.2%)
Intermediate	90 (20.6%)	35 (12.1%)
Graduate	37 (8.5%)	82 (28.3%)
Post graduate	10 (2.3%)	35 (12.1%)
Semi-professional (1 nurse)	0%	1 (0.3%)
Professional	4 (0.9%)	21 (7.2%)
Occupation mother	**Number **(%)**	**Number (%)**
Not specified	68 (15.6%)	52 (17.9%)
Housewife	327 (74.8%)	180 (62.1%)
Government job	36 (8.2%)	55 (19%)
Private job	6 (1.4%)	3 (1%)

*Death=3, # Death=1, **Death=2

Amongst the nursing students, majority of them were in Bsc nursing (51.3%). Whereas in medical students studied, most of them belonged to 3rd year MBBS (30.7%) with only 6.9% intern female MBBS students posted in the department was also included in the study

The 3 fathers and 2 mother amongst nursing students were expired. While only 1 father expired in medical students The mean age of the students was almost same i.e 20 years with higher number of female students

studied in both the groups of students, being 94.8% (nursing) & 60% (medical). Majority of them with 91.8% in nursing and 88.3% in medical were hindu by religion. And 64.9% in nursing and 72.4% in medical belonged to the general caste.

Despite the higher percentage of literates with 78.4% in nursing and 85.3% in medical, there were 0.5% & 0.3% illiterates fathers respectively. The 2.3% and 16.3% fathers were professional respectively .More than half percentage of the fathers in both groups of students were in government job.

The cumulative percentage of literates mothers respectively in nursing & medical students was 75.5% & 71% and whereas that of illiterates was 1.8% in nursing & 4.1% in medical. Majority of their mothers were housewives with 74.8% in nursing and 62.1% in medical.

Table 2: Source of information and Percept of students about some aspects of eye donation

Heard about eye donation	**Nursing (%)**	**Medical (%)**
	n=439	**n=290**
Yes	411 (93.6%)	290 (100%)
No	28 (6.4%)	0%
	Nursing (%)	**Medical (%)**
Source of information*	**n=411**	**n=290**
Medical personnel	82 (19.9%)	128 (44.1%)
Teachers	46 (11.2%)	135 (46.6%)
TV/newspaper	299 (72.7%)	220 (75.9%)
Family members	29 (7.05%)	62 (21.4%)
Others (by advertisement, public awareness)	1 (0.24%)	23 (7.9%)
Did not answer	13 (3.2%)	3 (1.03%)
Ideal time for eye donation	**n=411**	**n=290**
<2 hrs	231 (56.2%)**	68 (23.4%)
2-6 hrs	107 (26%)	196 (67.6%)
6 hrs to ≤ 1 day	19 (4.6%)	10 (3.4%)
Any time after death	34 (8.3%)	4 (1.4%)
Did not answer	20 (4.9%)	12 (4.1%)
Usage of donated eyes*	**n=411**	**n=290**
To transplant full eyeball	161 (39.2%)	60 (20.7%)
Corneal transplant/corneal grafting	155 (37.7%)	214 (73.8%)
Lens transplant	51 (12.4%)	21 (7.24%)
None of the above	10 (2.43%)	1 (0.34%)
Did not answer	34 (8.27%)	13 (4.5%)
Cataract eyes can be donated	**n=411**	**n=290**
Yes	62 (15.1%)	154 (53.1%)#
Person wearing glasses can be donors	**Number (%)**	**Number (%)**
	n=411	**n=290**
Yes	128 (31.1%)	242 (83.4%)##
Diabetes or Hypertensives can be	**Number (%)**	**Number (%)**
	n=411	**n=290**
Yes	99 (24.1%)	180 (62.1%)###
Persons with hepatitis or HIV/AIDS can be donors	**Number (%)**	**Number (%)**
	n=411	**n=290**
Yes	73 (17.8%)	106 (36.6%)####

*Multiple responses,** (n=1 said for 5min), **#**(n=2 said if cornea healthy, n=1 said if operated) **,##**(n=2 said if cornea healthy),### (n=2 said if cornea healthy),#### (n=1 said if vascular supply absent)

Among the 10 professional fathers in nursing students, 2 were engineers and rest were teachers. While among 4 professional mothers, all of them were teachers. Among the 47 professional fathers in medical students, 18 were doctors, 17 were engineers, 4 were advocates, 2 did MBA/chartered accountant, 1 was police officer and 5 were teachers. While among the 21 professional mothers, there were 4 doctors, 2 were advocates, 1 did MBA/chartered accountant and 14 were teachers.

Unlike all the medical students had heard about eye donation, the 93.6% nursing students were aware. Mass media (TV/newspaper) is the major source of information for spreading awareness in 72.7% nursing and 75.9% medical students. The correct time for eye donation which is within 6 hrs after death of an individual was known to 82.2% nursing and 91% medical students. There was lack of correct information for time of eye donation in 17.8% nursing and 8.9% medical students.

The correct usage of donated eyes was known to slightly more than one-third of nursing students unlike less than three-fourth of medical students. The percentage of medical students respondents regarding some selected aspects of eye donation like donation of cataract eyes, persons wearing glasses, diabetes or hypertensives, hepatitis or HIV/AIDS can be donors was higher that is 53.1%, 83.4%, 62.1%, and 36.6% respectively. These corresponding percentages in nursing students was 15.1%, 31.1%, 24.1% and 17.8% respectively. (Table 2)

Table 3: Percept of students about some aspects of eye healthcare

Some aspects of eye health care	**Nursing**	**Medical**
	(n=439)	**(n=290)**
Role of awareness on eye problems (poor vision, watering, discharge)	416 (94.7%)	278 (95.8%)
Vitamin A role in childhood blindness	420 (95.6%)	282 (97.2%)
Vitamin A abundant in green leafy vegetables and yellow fruits	422 (96.1%)	255 (87.9%) n=3 said that they contain precursor B carotene form
Role of students in spreading awareness among family members	423 (96.3%)	275 (94.8%)
First eye screening	**Nursing**	**Medical**
	(n=439)	**(n=290)**
<6months	87 (19.8%)	73 (25.2%)
6 month to 3 yr	55 (12.5%)	87 (30%)
3- 6 yr	71 (16.2%)	31 (10.7%)
None	38 (8.7%)	7 (2.4%)
Did not answer	48 (10.9%)	92 (31.7%)
Said yes but did not choose any given option	140 (31.9%)	0%
Aware about national programme for control of blindness in India	**Nursing**	**Medical**
	(n=439)	**(n=290)**
	264 (60.1%)	209 (72.1%)

Regarding the role of awareness on eye health, vitamin A role in childhood blindness, abundance of vitamin A in green leafy vegetables and yellow fruits and role of students in spreading awareness among family members, both the groups of students had good knowledge. The 12.5% of nursing and 30% of medical students had said that the first eye screening should be done in between 6 months-3 years. Also, the 60.1% of nursing and 72.1% of medical students had awareness about national programme for control of blindness in India.(table 3)

The students who got agreeable attitude for eye donation was 59.7% in medical and 69.9% in nursing students. Amongst nursing students, the thought of pleasure to help the blind was noticed in higher (69.4%) . While, noble cause was considered to be the reason for eye donation in medical students in 53.7% followed by the thought of

pleasure to help the blind in 47.9%. In nursing students, the reasons for non-willingness for eye donation was health related problem and age factors each with 18.2%. Whereas medical students pointed out for objection from family (21.4%) being the prime reason for non-willingness for eye donation.(table 4)

Table 4: Attitude of students about eye donation and reasons for willingness/non-willingness for eye donation

Attitude towards eye donation	**Nursing (n=439)**	**Medical (n=290)**
Agree	307 (69.9%)	173 (59.7%)
Disagree	11 (2.5%)	19 (6.6%)
Not sure	121 (27.6%)	98 (33.8%)
Reasons for willingness for eye donation*	**Nursing (n=307)**	**Medical (n=173)**
Noble cause	33 (10.7%)	93 (53.7%)
Pleasure to help the blind	213 (69.4%)	83 (47.9%)
Monetary benefits	8 (2.6%)	3 (1.7%)
Inspired by an article/magazine	19 (6.2%)	22 (12.7%)
Influenced by knowledge in academics	15 (4.9%)	26 (15%)
Friends received cornea	2 (0.6%)	3 (1.7%)
Friends/family members donated cornea	1 (0.3%)	8 (4.6%)
Unspecified reasons	34 (11.1%)	10 (5.8%)
Reasons for non –willingness for eye donation*	**Nursing (n=132)**	**Medical (n=117)**
Objection from family	12 (19.1%)	25 (21.4%)
Body ill treated by organ transplant	8 (6.1%)	12 (10.3%)
Health related problem	24 (18.2%)	3 (2.6%)
Dislike basic idea of eye donation	12 (9.1%)	2 (1.7%)
Religious myth	2 (1.5%)	4 (3.4%)
Age factors	24 (18.2%)	3 (2.6%)
Not sure about correct use of cornea after extraction	22 (16.7%)	12 (10.3%)
Unspecified reasons	31 (23.5%)	44 (37.6%)
Did not answer	0%	24 (20.5%)

*Multiple response

Table 5: Association of the some aspects of eye health, awareness and willingness of eye donation amongst medical/nursing students

	Medical (n=278)	**Nursing (n=391)**	**Odd Ratio**	**Inferential test**
Ideal time for eye donation is ≤6 hours (Yes)	264 (95%)	338 (86.4%)	2.957	Chi sq is 13.084 df=1 P is 0.001
	Medical (n=198)	**Nursing (n=391)**	**Odd Ratio**	**Inferential test**
Time of first eye screening is ≤6 months(Yes)	73 (36.9%)	87 (22.3%)	2.041	Chi sq is 14.196 df=1 P is 0.001
	Medical (n=290)	**Nursing (n=439)**	**Odd Ratio**	**Inferential test**
Role of Vitamin A in blindness (Yes)	282 (97.2%)	420 (95.7%)	1.595	Chi sq is 1.206 df=1 P is 0.272
Role of awareness on eye health (Yes)	278 (95.9%)	416 (94.8%)	1.281	Chi sq is 0.463 df=1 P is 0.496
Source of Vitamin A is green leafy vegetables and yellow fruits	255 (87.9%)	422 (96.1%)	0.294	Chi sq is 17.712 df=1 P is 0.001
Aware about eye donation (Yes)	290 (100%)	439 (93.6%)	-	Chi sq is 19.235 df=1 P is 0.001
Willingness for eye donation (Yes)	173 (59.7%)	307 (69.9%)	0.636	Chi sq is 8.2 df=1 P is 0.004

The awareness about the ideal time for eye donation (≤6 hours post death) was higher in medical than nursing students (95% versus 86.4%) and the difference is significant statistically. Also, the timing of the first eye screening (≤ 6 months post birth) was known to 36.9% medical and 22.3% nursing students and this difference is also significant statistically.

Regarding the role of vitamin A in blindness and role of awareness on eye health was known to almost equal number of medical and nursing students and hence the difference is not significant statistically. But the source of vitamin A being green leafy vegetables & yellow fruits was known to fairly greater number of nursing (96.1%) than medical (87.9%) students and hence the odd ratio is <1 with significant difference observed. The difference in the willingness for eye donation was also significant statistically being higher (69.9%) in nursing students with odd ratio of 0.636 (<1).

There was significant difference observed about the awareness about eye donation amongst medical and nursing students.

DISCUSSION:

It has been envisaged to provide ophthalmic services that is one ophthalmic surgeon for every five CHCs under NRHM (National Rural Health Mission) in Indian Public Health Standards (IPHS). [18] In line with these curative services, there is a need for capacity building of young future health functionaries which can be achieved by collecting data about their percept for eye donation/healthcare and find out the gaps in their knowledge. The concept of assessing the awareness level of the community inclusive medical and nursing students is embodied in the National Programme of Control of Blindness (NPCP 1976).[19]

Talking about the gender distribution in the study, the female students were studied in higher proportion in both medical and nursing students (60% and 94.8% respectively). This finding corroborates with the study conducted on nursing students in Karnataka where they have taken 88% female students. [20] In our study, all the nursing students were from three private nursing colleges unlike 86% in Karnataka study. [20] The frequency of third year medical students enrolled in the current study is 30.1% which is comparable to the study done on medical students in Bhopal.[21] But the authors in Bhopal study has included 44% female students which is lesser than our study.

The awareness level of medical students about corneal donation in the twin studies of Nigeria in different years ranged from 47.7% to 79.4%. [22,10] Also, in a study conducted in Delhi, the author has reported that 79.6% surveyed medical students were well aware of corneal donation from deceased donors. [4] Regarding the awareness of nursing students about corneal donation, the studies found that the percentage vary from 96.8% to 100%. [23,20] In the current study, more than four-fifth nursing students (93.6%) and all the medical undergraduates had heard about eye donation. The

increased awareness of students in our study may be due to enhanced community participation of the students regarding eye donation.

The mass media (TV/newspaper) was found to be the source of information on eye donation in amongst 75.9% medical students and in 72.7% nursing students in the current study. This finding is in agreement with the study done in Delhi on medical students where mass media such as television (77.8%), newspapers (72.8%) were found to be important source of information on eye donation. [24] Whereas the study in Nigeria has reported that mass media as leading source of awarenesss in only one-fifth medical undergraduates (20.6%). [22] The findings of the study done on nursing students in Karnataka corroborates with our study where newspaper (34.25%) and television (33.5%) was commonest source of information for eye donation, although the percentage is lesser than our study.[20] On the other hand, the study by Rimjhim Kumari on nursing students in Karnataka, the television is backed by 40% students. [25]

Cornea can be enucleated from any deceased person within time duration of 6 hours from the actual time of occurrence of death. [26] The studies done in Nigeria and Delhi on medical students regarding the awareness about the ideal time for eye donation that is ≤ 6 hours post death was found to be less than one-fifth students (11.2%), less than half (41.1%) respectively. [22, 24] On the other hand, other studies such as by Kannan KA and Dhaliwal U has reported more than half (63.3%) of medical students and 56% in a study by Aruna Gupta and colleague knew that eyes should be donated within six hours. [14,4,27] In contrast to above findings, our study has found a higher percentage (91%) of medical students knowing about the correct time for eye donation. In the current study, the nursing students too also had higher percentage of awareness (82.2%) about the ideal time of eye donation. This may be due to greater number and different years of nursing students being studied. The study done in Bangalore on nursing students has reported lesser percentage of awareness (38.2%) of the correct time of eye donation while the other studies done in India has found the awareness frequency percentage (75.5% and 70% respectively) comparable to the present study. [23,20, 25]

More than half of the medical students in different cited studies in the past were knowing that cornea is the part of the eye used in eye donation except that of 27.1% and 15% in twin Nigerian medical students. [10,22, 27-29] In our study also, more than three-fourth medical students knew about that cornea is used in eye donation. In contrast to medical students, only one-third nursing students in this study had knew about the corneal usage in eye donation which is lesser as compared to the study done in Karnataka where 58.5% knew that cornea only can be donated. [20]

The cataract eyes as donor was rejected by 56.1% medical students in a study in Nigeria. [22] Almost similar percentage of medical students (46.9%) in the present study had said that cataract eyes should not be donated while the comparatively greater proportion of nursing students (93.8%) of our study opined that cataract eyes should not be donated as compared to 30.7% environmental science students in Nigeria study. [22] On the other hand, in a study in Gujarat slightly more than one-fifth medical students (22%) answered that cataract or any other ocular disease or the use of spectacles render the cornea unfit for donation. [27]

In the various studies conducted in developing country like Nigeria and in Delhi and Gujarat, the percent response for positive attitude towards eye donation amongst medical students varied from 13.1% to 87.8% which may be due to regional differences, different semesters and number of medical students studied. [22,4,24,27] However, our study observed that 59.7% medical students had agreed for eye donation with 33.8% were not sure about their willingness for eye donation. Pertaining to the willingness of nursing students for eye donation, our study observed that more than half (69.9%) were willing to donate their eyes and the main reason behind eye donation was pleasure to help the blind in 69.4%. This finding is in agreement with a study done on nursing students in Karnataka where 64.25% were willing to donate their eyes to save vision of blind people.[20] However, Gupta and colleague found a higher percentage of nursing students (85.1%) who were willing to donate their eyes and nobility in the act of eye donation was the main motivational force for donation according to 85.6% students. [23]

The family objection as the reason for non-willingness for eye donation amongst medical students in the current study was 19.1% which is lesser in comparision to the study done in Delhi where they have found to be is 27.7%. [24] In contrast, the medical graduates in Bilaspur study responded for 3% for objection from family members. [29] The reason for unsuitability to donate because of health problem in medical students in the current study was 18.2%. This is in accordance with the study done in Delhi where they have reported to be is 17.7% whereas the Bilaspur study has revealed that only 2% medical students said unsuitability to donate because of health problem. [24,29]

Conclusions: The awareness about eye donation was 100% in medical and 93.6% in nursing with mass media (TV/newspaper) constituted the greatest source of information in 72.7% (nursing) and 75.9% (medical). The incorrect information for the ideal time of eye donation was given by 17.7% students and for the incorrect usage of donated eyes was given by 79.5% students. The awareness of medical students was comparatively higher than nursing about the disease/conditions the eyes can be donated. The role of awareness, vitamin A role and correct source of vitamin A was known to majority of the students. However, the time period for first eye screening was known to less than 20% (nursing) and 25.2%

(medical). The unfavourable attitude towards eye donation was observed in 70.5% students. Significant difference was observed in the percept of ideal time of eye donation and correct time period of first eye screening amongst medical/nursing students with non significant difference seen in aspects of eye health care, awareness and willingness of eye donation.

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Gender difference in quarterly out of pocket expenditure on Diabetes care in Thoothukudi – a cross-sectional study.

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ABSTRACT

Background: Diabetes Mellitus is a long term disease which require higher medical expenditure. If inadequately treated or undiagnosed, it leads to multiple chronic complications, which again increase the expenditure multi-fold. Gender has got implications in diabetes care due to sex differences as well as that of social inequities entrenched within gender. This study is done to compare quarterly Out of Pocket expenditure (OOPE) on diabetes care with gender as a covariate. **Methods :** Quarterly OOPE is defined as any expenditure incurred by households as a payment to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services during the last three months due to diabetes. A cross sectional study was done in Thoothukudi Corporation among 180 diabetic patients using a semi structured questionnaire. **Results:** Among the study participants, 49.2%were males and 50.8% were females. The median quarterly OOPE for males was Rs.2387 with an interquartile range of Rs.2742 and that of females was Rs.1249.42 with an interquartile range of Rs.2836 which was statistically significant(p value -.0.01). The proportion of family monthly income spent on diabetes care was also significantly lower for women(2.6%) compared to men (4.48%). **Conclusion:** The quarterly OOP expenditure was significantly lower among women compared to men. In a country like India, where larger share of health expenditure is contributed through OOPE, this finding is revealing that gender equity in diabetes care is nowhere near its reach.

Key Words: out of pocket expenditure, gender, Diabetes, Inequity

INTRODUCTION

Gender inequity is a phenomenon which is well recognised in health and also in access to health care.[1–6] The prevalence of diabetes is increasing most rapidly among women. Also, women with diabetes are at increased risk of developing complications like coronary artery disease, kidney disease, blindness and depression than their male counterparts. Women also have the higher prevalence of risk factors of Diabetes like overweight, physical inactivity compared to men. [7]

Diabetes Mellitus is of concern not only because of the impact it creates physically, but also because it creates an impact on the emotional, psychological, social and economic aspects of the individual as well as that of their family. [8–16] Diabetes Mellitus is a long term disease which requires higher medical expenditure.[17] If inadequately treated or undiagnosed, it leads to multiple chronic complications, which again would increase the expenditure multifold.[15,18] Diabetes which is called as a costly disease by United Nations, with weaker public health system in addition would warrant a higher out of pocket expenditure from the patients. [17]

Women's higher risk of getting diabetes and its complications, could not only be explained by the biological differences, but also social structure plays a significant role.[19] Gender has got implications in diabetes care, due to sex differences and the social inequities entrenched with gender. While studies have looked at various social covariates and diabetes outcomes as well as expenditure, gender has not been looked closely. [20,21] Studying gender from close quarters would pave way for improving equity in diabetes care. Quarterly OOPE is defined as any expenditure incurred by households as a payment to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services due to diabetes in 3 months recall period. OOPE includes direct medical cost (money spent on consultation, investigation, medication, hospitalization, management and treatment of complications), direct non-medical cost (money spent on transport to health facilities and lifestyle modification) and indirect cost(income lost to the patient and caregiver due to absenteeism). The findings of this study will help in understanding gender inequity in OOPE and explore strategies to bring in parity. The objectives of this study is to study the gender difference in the quarterly OOPE and the factors influencing the difference.

This study is a sub study of another study which aimed at assessing the quarterly OOP expenditure incurred towards diabetes care.

METHODS

A community based cross sectional study to assess the out of pocket expenditure on diabetes care was conducted among people with diabetes mellitus in urban areas of Thoothukudi Corporation of Tamilnadu during April 2016 to June 2016.The district sex ratio is 1023, which is higher than Tamilnadu's sex ratio of 996.Thoothukudi had relatively lesser gender inequity if sex ratio were to be considered as a proxy measure of gender equity. The study population included diabetic patients, more than 18 years of age with at least 3 months elapsed since the diagnosis of the disease, residing in the selected wards of Thoothukudi corporation. Gestational Diabetes Mellitus and guests who were present in the house were excluded from the study. The operational definition for Diabetic patients was those who had a history/clinical record for "physician diagnosis of diabetes and/or current use of medications for diabetes (insulin or oral hypoglycaemic agents).

The sample size was calculated for the main study with the objective of estimating the OOPE. The Mean quarterly OOPE was estimated to be Rs.3208.99 and Standard deviation Rs.2095.90 based on a pilot study. Therefore for a 95% confidence level and 10% relative precision of estimate, the sample size calculated was 164. Allowing 10% non-response rate, total sample size required came around 180.The sampling for the study population was carried out as Multi stage sampling method. In the first stage, two zones were selected of the four zones randomly. In the second stage five wards were randomly chosen from the selected zones. In the selected wards, a street was randomly selected from the list of streets. Then a random direction from the centre of the street was randomly selected by a spin of a pen. The houses in that direction were visited till 18 diabetic patients were obtained. In each house, all individuals who were fulfilling the criteria of operational definition were selected for the study.

The study tool was a semi-structured interview-based questionnaire administered by the investigators which was validated with the help of experts and pilot study and necessary modification was done after the pilot study. The questionnaire included details on socio-demographic details, disease profile, diabetes treatment seeking behaviour, details of expenditure on diabetes care in 3 months recall period and coping mechanism for increasing health-care expenditure. To avoid recall bias , the study participants were given sufficient time to reflect and think before answering and the self-reported information was verified through proxy sources like medical records, prescription and lab reports, bills, medicine blister packs. Socio-economic classification was done according to B.G. Prasad Classification based on the Consumer Price Index of May 2016.[22] Recent fasting and post-prandial blood glucose values taken during the past three months were obtained from available clinical records. A person was said to be under good glycemic control if the FBS value was < 126g/dl and PPBS <200g/dl in the most recent laboratory investigation done within last 3 months.Individuals who did not have blood sugar values tested in the last 3 months were considered glycemic level unknown. The clinical and expenditure details collected from the participants were crosschecked with records and bills available at the time of visit. Among the study participants, anybody with history of hospitalisation had all the bills. Among others, bills were available for verification with nearly 40% of the participants. In case of unverifiable bills, self-reported expenditure was cross verified with the routine cost of medicine, lab investigations and consultation fee based on the market price.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Information sheet was read to the individual and the purpose of the study was elaborated to the participants. After obtaining informed written consent from the individual, face to face interview was done based on the semi-structured questionnaire.

Analysis: Data was collected from 180 diabetic patients. Three individuals' data which was found to be incomplete and erroneous were excluded from the study. Thus the total study population accounted to 177 diabetic individuals. Data was analysed using Statistical Package for Software Solutions (SPSS) version 16. Due to the skewed distribution of the variables, the median values and interquartile ranges are reported. Median test was used for intergroup comparisons. Chi-square test was used for comparison of proportions.

RESULTS

Background characteristics:

Of the 177 patients interviewed, 87 were males (49.2%) and 90 were females (50.8%). From table 1, it is found that there is no significant difference in the background characteristics like age, religion and socio economic status between men and women. But there was a significant difference in the marital status, education level, occupation and financial dependency status. The findings of the demographic characteristics were as per the general patterns prevailing in the Indian society. While 70% of women were dependent on others for their finance, only 10% of men were dependent. There was no significant difference between males and females with regards to diabetes treatment seeking behaviour as shown in table 2. But with respect to the outcome, it is found that more women suffered from more than two complications and poor glycemic control.

Among the study population, the median quarterly OOPE for males was INR 2387 with an interquartile range of INR. 2742 and that of females was INR. 1249.42 with an interquartile range of INR.2836. Figure 1 shows a boxplot depicting the distribution of quarterly OOPE on diabetes among males and females.

Table 1. Background characteristics of the study population

Background characteristic		Male (n- 87)	Female (n -90)	p- value
Age in years [Mean (SD)][1]		56.84(10.91)	56.18(10.78)	0.686
Age category	20-30 years	1(1.1%)	1(1.1%)	
n(%)[2]	31-40 years	6(6.9%)	6(6.7%)	
	41-50 years	23(26.4%)	20(22.2%)	
	51-60years	23(26.4%)	34(37.8%)	0.738
	61-70years	24(27.6%)	22(24.2%)	
	71-80 years	9(10.3%)	5(5.6%)	
	81-90 years	1(1.1%)	2(2.2%)	
Marital status[2]	Married	79(90.8%)	67(74.4%)	
n(%)	Widow/widower	8(9.2%)	23(25.6%)	0.005
Religion[2]	Hindu	69(79.3%)	74(82.2%)	
n(%)	Muslim	3(3.4%)	2(2.2%)	0.836
	Christian	15(17.2%)	14(15.6%)	
Educational status[2]	Illiterate	0(0%)	5(5.6%)	
n(%)	Primary & secondary school education	45(51.7%)	59(65.6%)	**0.001***
	High school & higher secondary	8(9.2%)	12(13.3%)	
	Diploma and degree	34(39.1%)	14(15.6%)	
Occupation[2]	Unemployed	8(9.2%)	61(67.8%)	
n(%)	Unskilled	5(5.7%)	5(5.6%)	
	Semiskilled	12(13.8%)	4(4.4%)	
	Skilled	28(32.2%)	4(4.4%)	**<0.001***
	Professional	0(0.0%)	4(4.4%)	
	Landlord	2(2.3%)	0(0%)	
	Shop owner	10(11.5%)	1(1.1%)	
Financial dependency status[2]	Dependent	9(10.3%)	63(70.0%)	**<0.001***
n(%)	Independent	78(89.7%)	27(30%)	
Socio economic status[2]	Class I	21(24.1%)	21(23.3%)	
n(%)	Class II	41(47.1%)	49(54.4%)	
	Class III	18(20.7%)	16(17.8%)	0.764
	Class IV	6(6.9%)	4(4.4%)	
	Class V	1(1.1%)	0(0%)	

1 – Independent Sample t test, 2 – chi square test , *- statistically significant at p value -0.05

There was a statistically significant difference in the quarterly OOPE on diabetes between men and women (Mann-Whitney U test, *P 0.01*). Among the study participants, 5 men (5.7%) and 5 women (5.6%) were hospitalised in the past 3 months. The reason for hospitalisation among men was myocardial infarction and diabetic ulcer and among women it was myocardial infarction, ulcer, nephropathy cataract and cerebro-vascular Accident.

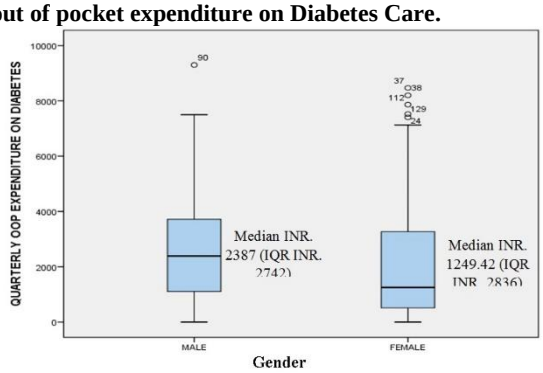

Figure 1 **Boxplot showing quarterly OOPE on diabetes among male and females**

Mann Whitney U test, statistically significant at p value <0.05

Table 2: Diabetes clinical Characteristics of the study participants

Clinical Characteristic		Male (n- 87)	Female (n -90)	p-value
Type of health sector from which Diabetes care is sought [2]	Government	15(17.2%)	19(21.1%)	0.722
n(%)	Private	70(80.5%)	68(75.6%)	
	Both	2(2.3%)	3(3.3%)	
Diagnosis[1]	Incidental	65(74.7%)	71(78.9%)	0.594
n(%)	Voluntary	22(25.3%)	19(21.1%)	
Duration of diabetes since diagnosis[2] Median years (IQR)		6(12)	6.5(9)	0.83
No of comorbid conditions[1]	Nil	41(47.1%)	44(48.9%)	
n(%)	1comorbid condition	29(33.3%)	31(34.4%)	0.313
	2comorbid conditions	17(19.5%)	12(13.3%)	
	>2comorbid conditions	0	3(3.3%)	
Complications [1]	No complications	50(57.5%)	67(74.4%)	
n(%)	1 complication	36(41.4%)	20(22.2%)	**0.010***
	>1 complication	1(1.1%)	3(3.3%)	
Glycemic control[1]	Not known	5(5.7%)	11(12.2%)	
n(%)	Good control	52(59.8%)	30(33.3%)	**0.002***
	Poor control	30(34.5%)	49(54.4%)	

1 – chi square test,2 – Mann Whitney U test *- statistically significant at p value -0.05

From figure 2, it is established that in both the sex, almost 3/4th of the total expenditure incurred is towards direct medical cost. But in absolute numbers, the median direct medical cost among men was Rs. 2000,(IQR -2630) and among women was Rs.1143.93(IQR – 2426) [Mann Whitney U test, *P 0.063*].Men had a higher proportion of expenditure incurred towards indirect cost, while women had spent towards direct non- medical cost which includes transportation and diet modification. Direct non-medical cost incurred among men was Rs.60(IQR -270) and women Rs. 50 (IQR – 180) [Mann Whitney U test, *P 0.275*). Proportion of monthly family income spent on diabetes for males was 4.48% (IQR – 6.34) whereas among females it was 2.6% (IQR – 6.24) which was

statistically significant as shown in figure 3. (Mann Whitney U test, *P 0.014*).

Table 3. Gender differences in quarterly OOP with relation to other socio-demographic factors.

Socio-demographic characteristic		Male In INR. Median (IQR)	Female In INR. Median(IQR)	p value
Age category	31-40 years	1740(1549)	1170.30(1880)	0.818
	41-50 years	2190(4814)	1168.47(2178)	0.161
	51-60years	2727.78(4067)	1050.13(3583)	0.039*
	61-70years	3180(2075)	1592.5(3365)	0.272
	71-80 years	2498(4156)	3535 (16588)	0.797
Marital status	Married	2570(2894)	1248.83(2762)	0.012*
	Widow/widower	2205.72(1823)	1368.83(3177)	0.842
Financial dependence status	Dependent	2200(3233)	995.25(2441)	0.153
	Independent	2400.33(2784)	2030(2817)	0.781
Religion	Hindu	2498(3291)	1309.42(2821)	0.019*
	Muslim	1253.85(0)	4101.55(0)	0.8
	Christian	2270.2(2040)	940.04(2567)	0.186
Education	Illiterate	0	400(734)	
	Primary and secondary	1840(2477)	1235(2729)	0.355
	High school and higher secondary	2957(5330)	2153(4500)	0.427
	Diploma and degree	3117(3219)	1680.43(3819)	0.212
SES	Class 1	3392(4707)	1701.15(7005)	0.263
	Class II	2570(2688)	1235(2342)	0.069
	Class III	2045(2191)	1176.92(1711)	0.081
	Class IV	781(1080)	557.5(4591)	0.762

Statistical test performed- Mann Whitney U test. *- statistically significant at p value -0.05

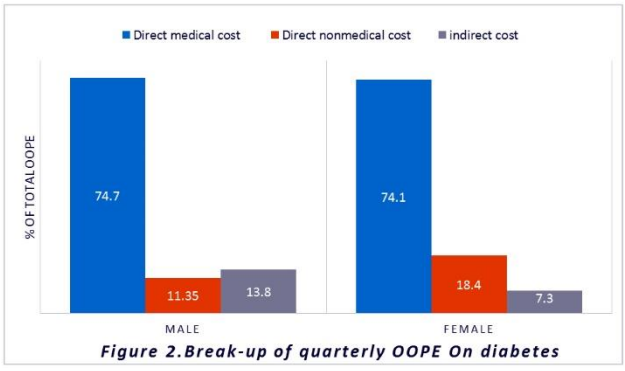

Figure 2.Break-up of quarterly OOPE On diabetes

As shown in Table 3,there is an increase in the quarterly OOPE spent on Diabetes with age up to 70 years of age among males. The gender difference is very evident in all the age groups, with a wider difference in the 51-60 age group. Among very old (71-80 years) females are spending more than the males. With regards to marital status, when they are living together females tend to spend less than when they are alone, while the reverse is true in males. In either cases, females are spending less than the male counter parts. Similarly, women who are financially dependent on others spend only half of what independent women do, but the irony is irrespective of the financial dependence status, females spend less than what the males do. Religion wise, there is a gender difference among Hindus.

Table 4. Gender differences in quarterly OOP with relation to disease characteristics.

Disease characteristic		Male (INR) Median(IQR)	Female(INR) Median(IQR)	p value
Hospitalisation	Yes	9300(51922)	39054(47049)	0.841
	No	2260(2421)	1193.86(2401)	0.007*
Duration of diabetes	< 1 year	1382.5(2636)	575(1316)	0.351
	1-5 years	1640(2043)	1088.11(1563)	0.188
	5-10 years	2721.8(3920)	1462.9(2273)	0.093
	10-20years	2743.6(2762)	2252.3(4386)	0.619
	>20 years	3825(4184)	2240.2(4989)	0.22
Mode of diagnosis	Incidental	2270.2(3613)	1248.8(2762)	0.010*
	Voluntary	2572.5(2867)	1376(4184)	0.583
Comorbidities	Nil	1570.9(2304)	930(1477)	0.086
	1 comorbidity	3305(4718)	1250(4533)	0.068
	2 comorbidity	3160(3175)	2629.28(5648)	0.444
	>2 comorbidities		7403.1	
Complications	No complications	1740(2253)	800(1269)	0.020*
	One complication	3325(4055)	2849(5040)	0.578
	>1 complication		8469	1
Health Service provider	Government	460(2130)	90(750)	0.8
	Private	2631.9(2653)	1597.5(3129)	0.43
	Both	4309.8	700	0.063
	Not known	513(1460)	513(895)	0.827
Glycemic control	Good control	2631.9(3807)	1680.4(2958)	0.368
	Poor control	2270.1(1860)	1248.8(3334)	0.040*

Statistical test performed- Mann Whitney U test. *- statistically significant at p value -0.05

With increasing education status, there was an increase in the amount spent on Diabetes among males. But the pattern was not similar among women. Irrespective of the level of education, the gender difference continued to exist. This was also true with regards to SES as well, wherein there was a larger gender difference among the well off. The gender difference was declining as one moves down the SES.

Table 5. Differences in the coping mechanisms adopted

Coping mechanisms	Male	Female
Loan	3(3.4%)	3(3.3%)
Company reimbursement	3(3.4%)	4(4.4%)
Medical insurance	8(9.2%)	3(3.3%)
Mortgage	3(3.4%)	1(1.1%)
Personal savings	69(79.3%)	79(87.8%)
Selling property	1(1.1%)	0(0%)

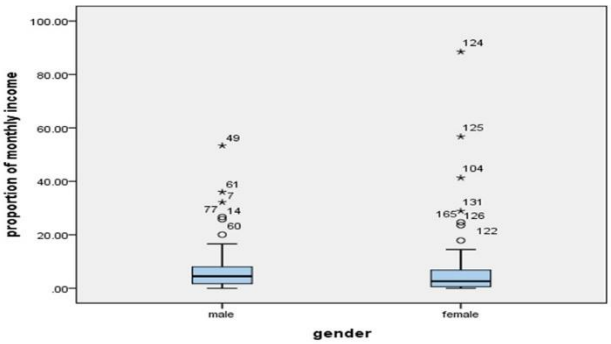

Figure 3. Gender difference in proportion of monthly income spent on Diabetes

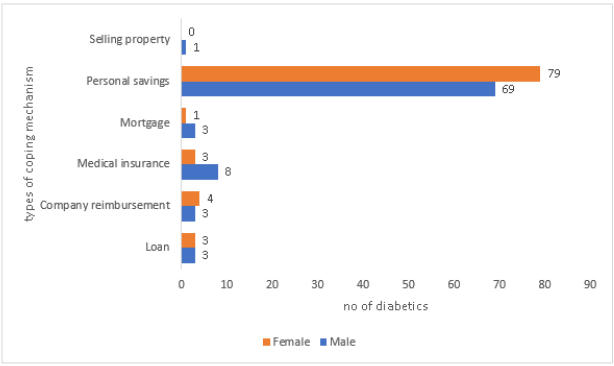

Figure 4: Differences in the coping mechanisms adopted

Among non-hospitalised patients, females are spending less than the males, which was statistically significant. With increase in duration of diabetes, the amount spent on diabetes increases in both the sexes, but the gender difference continues to persist. From table 4, it is also evident that gender difference continue to persist irrespective of the mode of diagnosis, type of health sector approached for diabetes care, number of comorbidities and complications present. With regards to glycemic control, there was no difference in the OOPE between men and women if their glycemic status was not known. But at the same time, there was a statistically significant difference in the quarterly OOPE incurred between men and women who had a poor glycemic control.

From table 5, it is evident that both the gender had to cope with the OOPE from the personal savings. While 9.2% of the males had the benefit of medical insurance, only 3.3% of the females had it.

DISCUSSION

There are various studies which had provided evidence for gender inequality in health and access to health care services. [1–6] While various studies has looked at difference in OOPE, across economic class and place of residence, gender is often neglected.[23–25] It is evident from this study, that there is a gender difference in quarterly out of pocket expenditure for diabetes care, where women spend almost only half of what their male counterparts do. In a Low Middle income country like India, where major contribution towards health expenditure is through OOPE, this finding carries a huge significance.[26] This is important in the context that 21.92% of the population in India are living below the poverty line.[27] Thoothukudi, where the present study is conducted can be considered as a district with lesser gender inequity by considering sex ratio as a proxy measure for inequity. But even in this district, it is evident from the study that women do not enjoy similar social status as what men do. Women lag behind men in terms of education, which has an effect on occupation and financial dependency status. In all these factors women were at a disadvantaged position than men.

Gender difference in OOPE is not unique to Thoothukudi district or to diabetes. A study was done to assess the gender difference in Health care expenditure towards different morbidity using two rounds of the longitudinal, nationally representative survey known as the India Human Development Survey (IHDS), - IHDS 1 (2004-205) and IHDS 2(2012-13).It was found that irrespective of the type of morbidity and survey rounds, females spent lesser than males.[28,29] A secondary data analysis of the National Sample Survey Organization (NSSO) data of the 55th (1999-2000) and the 64th (2007-2008) rounds also showed that higher amount is spent on elderly males for health and food than on elderly females in all regions of India. Though the health expenditure on the elderly women had increased from the first to the second survey period, a huge disparity was still seen between the two gender. [30]The scenario in developed countries is a little different wherein females spend high OOPE compared to males.[31,32] But that doesn't mean these countries are progressive in terms of gender equity, as in developed countries most of the health expenditure is borne by mechanisms other than OOPE.[33] In such a context, women spending higher OOPE males is a grave sign of gender inequity despite economic progress.

In the present study, it is found that the gender difference was the highest among the richest economic class and the least among the poorest class. Similar finding was also found in other studies, which showed the gender difference in health care expenditure was seven times higher among the richest quintile compared to the lowest quintile. [28,29]

The gender difference is seen across all age group, education status and economic class. . Illiteracy level was high among women and majority of the women in the study group were unemployed. This could contribute to the gender difference in the outcome of the disease as uneducated, unemployed people with diabetes who cannot afford or do not have access to even minimum healthcare facilities are likely to be diagnosed late. They are at increased risk of developing diabetes related

complications due to delays in diagnosis and/or improper treatment.[21]

It is important to note that 70% of the women who participated in the study are financially dependent on some body, whereas only 10.3% of the men were dependent. The gender difference in OOPE towards diabetes care is further perpetuated by the financial dependency status. The sequelae of this financial dependence is that they have little say in decision making. This is evident from the gender difference in proportion of monthly family income being spent towards diabetes care, while men spend 4%, women spend only 2% on an average. It is also evident from the study, even among financially independent women, the median quarterly OOPE incurred by women is less than that of the men. It is spelled by different studies that utilisation of health care by women is mediated by their role in decision making and resource allocation within households. It is also found that a woman is more likely to be included in the decision making process provided she earns more or as equal to that of her husband. [28,34]These findings clearly point out that women due to lack of access to paid employment, irrespective of her education status due to the social norm of engaging in household work which is yet not accounted for economic outcome and less say in decision making process in the family, tend to spend less for their health, delaying or not utilising the health care facility.

It is well established that OOPE acts as a barrier to access health care. The socio-economic disadvantages faced by the women further amplifies the risk of developing worse outcomes of the disease, who are already at greater risk of developing the disease and the complications compared to men. Gender disparity in OOPE cannot be considered as a random occurrence and dismissed, for it has an impact on the outcome of the disease. It is evident from the study that women spend less than men and also larger proportion of women suffer from poor glycemic control than men. Lower spending on diabetes care could be a causal effect of poor glycemic control. Studies had established that OOPE prevent more women than men from utilising essential health services. [34] Studies have also shown that patients tend to forego medicines depending on their ability to pay.[35–37]

The gender difference in OOPE is prominent if there was no hospitalisation. Among hospitalised there is no gender difference. The vulnerable by cutting the cost on primary and secondary prevention, tend to bear higher cost at a later stage due to complications, because of failure of prevention. The cost of treatment is high but the cost of doing nothing is far greater.[38]This is evident from this study, as the cost of hospitalisation is much higher.

Social security measures like medical insurance was the coping strategy adopted by 9% of men compared to 3% of women which is again a reflection on how women are being left out from the social protection mechanisms.

Conclusion: It is quiet evident from the present study, that women are spending less OOPE on diabetes care than men. The gender difference in OOPE was persistent at all education level, economic position, marital status and financial dependency status. Self- report response bias and recall bias could be a limitation of the study .However measures were taken to reduce the bias by triangulating the information given by the participant with the records and bills that were available with the participant whenever available. It is also important simultaneously to look at strategies to reduce the gender difference in OOPE towards diabetes care.

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Nutritional assessment among postnatal mothers availing health services at a maternity hospital in rural Karnataka

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ABSTRACT

Background: The postnatal period is a time of heightened nutritional needs. The recommended dietary allowance(RDA) of energy, protein, micro-nutrients like iron, calcium, vitamins, zinc and folic acid are enhanced during this period. This helps to satisfy the demands of lactation and protects the infant from nutrient deficiencies. **Objectives:** To assess the nutritional intake and its associated factors among postnatal mothers availing health care services at a rural maternity hospital in Ramnagara district, Karnataka. **Methods:** This cross sectional study was conducted among 159 postnatal mothers over a two-month period (July-August 2014). Written informed consent was obtained and a face-validated, semi-structured interview schedule administered. The socio-demographic data, obstetric history, detailed dietary history with a 24-hour dietary recall was obtained. Nutrient composition of the food item consumed was calculated using standard food conversion tables using an excel software developed for both raw and cooked foods. **Results:** Around 104 women were in the early postnatal period (within 1 week) and 55 were late postnatal (4-6 weeks). Majority were aged 18-25 years (81.1%), educated up to std 10 (44%) and belonged to Class II by modified BG Prasad's scale (34.6%). Majority had a normal vaginal delivery (79.2%) with child weighing >2500 gms (84.9%). Most women consumed inadequate calories (98.1%), proteins (94.9%), iron (49.7%) and calcium(65%). There was a significant association between the post-natal period and nutrient intake ($p<0.05$). **Conclusions:** Nutritional assessment and advice should form a key component during the postnatal visits to promote healthy eating and combat adverse immediate and long-term consequences.

Key Words: cross-sectional study, lactating women, nutrient intake, postnatal mothers, recommended dietary allowance .

INTRODUCTION

The post-natal period is crucial for both the mother and infant as additional maternal nutritional needs are to be met to ensure adequate breast milk production both in terms of quality and quantity by the infant. Healthy eating following childbirth plays a vital role in reducing the risk for many diseases[(I)].

Although some women may consume a healthy diet during their pregnancy[(ii)] these habits are slowly discontinued and often forgotten following childbirth[(ii,iii)]. This is particularly worrisome as increased intake of certain nutrients or the use of certain supplements is recommended in a lactating mother to satisfy the demands of milk production and to protect the infant from nutrient deficiencies[(iv)].

The recommended additional dietary allowance of energy during lactation period in India in the first 6 months is 600 kcal and 23 grams of protein/kg per day (RDA 2010).

The need for micro nutrients like iron, calcium, vitamin A, B, C, zinc and folic acid are also enhanced during lactation[(v)]. Consequences of under nutrition during lactation include poor immune status, maternal and infant morbidities, low milk production, poor cognitive development in child[(vi)]. Low milk production could result in cessation of breastfeeding and introduction of cow's milk or formula with bottle feeds. This has short-term consequences for the infant like diarrhoea, pneumonia, otitis media and growth faltering as well as long-term consequences for the mother (ovarian and breast cancer, diabetes and metabolic syndrome)[(vii)]. Considering that promotion and maintenance of lactation has a major role to play in child survival, the onus lies on the primary care provider to offer education, assessment and advice not only concerning the health of the new-born and mother, but also regarding maternal nutrition intake in the postpartum period.

Assessing nutrient intake of lactating women therefore is essential to examine whether women in developing countries like India consume adequate levels to maintain both their health and their child's health. While providing maternal health services at a rural maternity hospital in a village in Ramnagara district of South Karnataka, it was observed that many lactating mothers complained of less milk or poor milk flow and their diet seemed inadequate to meet their needs during this crucial period. This study was therefore conducted to assess nutritional intake and its associated factors among rural lactating mothers in order to identify gaps in nutrition and suggest corrective dietary measures.

MATERIAL AND METHOD

This was a cross-sectional study conducted at a rural maternity hospital in a village in Ramnagara District in southern Karnataka. All post-natal mothers who availed of obstetric and child health services over a two-month period (July-August 2014) were consecutively sampled and invited to participate in the study. Written informed consent was obtained from each subject following which the women were administered a face-validated, semi-structured interview schedule in the local language. This obtained the socio-demographic data, obstetric history and detailed dietary history including a 24-hour dietary recall. Data was collected by medical interns who were trained in administering the 24-hour dietary recall. Standard portion size models and additional probing during the interview were used to assist in obtaining the recall. Nutrient composition of the food item consumed was calculated using standard food conversion tables using an excel software developed for both raw and cooked foods[viii-x].

Women were categorised based on the post natal period as early postnatal (within 7 days of birth) and late postnatal (4-6 weeks post-delivery).

Statistical analysis: Descriptive data was reported as mean, standard deviation and percentages. Associations between intake of various nutrients and demographic/obstetric factors was done using Mann Whitney U test. A p value of <0.05 was considered statistically significant.

RESULT

A total of 159 postnatal mothers were included, 104 of whom were in the early postnatal period (within 7 days of birth) and 55 of whom were in the late postnatal period (4-6 weeks post-delivery).

Most of the women were aged 18-25 years (81.1%), were educated to std 10 (44%) and belonged to Class II by modified BG Prasad scale (34.6%). *(see table 1).* Majority had given birth to a child weighing 2500 gms or more (84.9%), and had a normal vaginal delivery (79.2%) *(see table 1)*

Table I: Socio-demographic details and obstetric characteristics of the post-natal women (n=159).

Variable	Category	N (%)
Age	<18 years	4 (2.5)
Mean = 22.6+ 2.9 years	18-25 years	129 (81.1)
	> 25 years	26 (16.4)
Education	Illiterate	1 (0.6)
Status	<10th standard	31 (19.5)
	10th pass	70 (44)
	PUC	33 (20.8)
	Degree	24 (15.1)
Husband's	Illiterate	8 (5)
Education	<10th standard	40 (25.2)
	10th pass	50 (31.4)
	PUC	24 (15.1)
	Degree	37 (23.2)
	Class I	38 (23.9)
	Class II	55 (34.6)
Socio-economic class	Class III	45 (28.3)
	Class IV	15 (9.4)
	Class V	6 (3.8)
Mode of	Normal vaginal delivery	126 (79.2)
delivery	Caesarean section	19 (11.9)
	Assisted delivery	14 (8.8)
Birth weight	< 2500 grams	24 (15.1)
	≥ 2500 grams	135 (84.9)
Antenatal complications	Urinary tract infection	11(6.9)
	Pregnancy induced hypertension	10(6.3)
	Anaemia	1710.7)
Postnatal complications	Post-partum haemorrhage	4(2.5)
	Fever	6(3.8)
	Abdominal pain	8(5)
	Wound infection	1(0.6)

Dietary intake

Around 147 (92.5%) women consumed a mixed diet. The staple food was rice for 77 (48.4%) of the women and ragi for 48 (30.2%), while the rest consumed both rice and ragi regularly. Almost 112 (70.4%) of the women consumed around 1 litre of water or less per day and the rest consumed 2 or more litres of water per day.

While 73 (46%) of the post-natal women consumed eggs at least once a week, only 11.3% and 12.6% consumed chicken and other meats at least once a week. The large majority of the women never consumed other sources of animal protein such as chicken (88.7%), fish (96.9%) and other meats (86.8%). Fruit consumption was also low among the mothers. Only 77 (48.4%) of the women consumed fruits on a daily basis.

Table II: Consumption of micro-nutrients and macro-nutrients by the post-natal women (n=159).

Nutrient	RDA for lactating women (sedentary)	Adequate Consumption (%)	Inadequate consumption (%)
Energy	2500KCal/day	3 (1.9%)	156 (98.1%)
Proteins	74gm/day	8 (5.03%)	151 (94.9%)
Iron	21mg/day	80 (50.3%)	79 (49.7%)
After supplementation with 100mg of elemental iron		126 (79.2%)	33 (20.7%)
Calcium	1000mg/day	55 (34.6%)	104 (65.4%)
After supplementation with 500 mg of calcium		84 (52.8%)	75 (47.2%)
Zinc	12mg/day	3 (1.9%)	156 (98.1%)
Folic acid	300ug/day	76 (47.8%)	83 (52.2%)
After supplementation with 500ug of folic acid		140 (88.1%)	19 (11.9%)
Vitamin A	950ug/day	6 (3.8%)	153 (96.2%)

Table III: Association between post natal period and daily nutrient consumption (n=159).

Nutrient intake	Early postnatal period Median(IQR)	Late postnatal period Median(IQR)	p value
Energy	1578.6(1392.4-1784.1)	1825.3(1547-2092.3)	0.001*
Protein	47.01(41.7-54.6)	51.9(45.7-59.7)	0.009*
Iron	16.5(11.5-80.1)	76.3(13.9-138.7)	0.002*
Calcium	596.4(247-1099.9)	1022(596.4-1694.1)	<0.001*
Zinc	6.2(5-7.4)	7.5(6.1-8.8)	<0.001*
Folic acid	272.7(215.7-380)	384.4(263.6-442.8)	0.003*

Mann Whitney U test),*-p<0.05

Nearly all the women (98.1%) consumed calcium, iron and folic acid supplements in the early postnatal period. However, this proportion was very small at 6 weeks or later (16.4%)*(see table 2).*

Majority of the post-natal mothers consumed a diet which was deficient in the required calories (98.1%) and proteins (94.9%). Almost half of the women consumed a diet deficient in iron while 65% were consuming a diet deficient in calcium. This reduced to 20.7% following supplementation with 100 mg iron and 47.2% following supplementation with 500mg calcium.

DISCUSSION

The recommended dietary intake (RDA) for most nutrients are increased during lactation. This increase is to cover for exclusive breastfeeding for the first six months. In this study, the overall diet intake during the post natal period was found to be inadequate. The energy and protein consumption was found to be grossly deficient among the women. This in turn will have an effect on the quantity and quality of breast milk and thereby on the nutritional status of the infant.

Only half of the women in our study met recommended intakes for fruit. The reason for the low consumption could be due to the cultural practices followed in Indian households wherein many fruits and vegetables are thought to be 'cold' foods and hence avoided in the postnatal period. Few studies that have been done previously to assess dietary intake in mothers, have similarly shown diet quality to be sub-optimal for women during the postpartum period[ii,xi]. Meat and fish as well as legumes and green leafy vegetables are the main dietary sources of iron. In this study almost all women were taking iron supplements (98.1%) early post-partum which progressively dropped to 16.4% at the end of 6 weeks post-partum. Findings of another study done to estimate the prevalence of post-partum iron deficiency anaemia show that 42% of women in the immediate postpartum period were taking regular iron supplements[xii]. While the National Family Health Survey report (NFHS 4) states that close to half of all pregnant women are anaemic (50.3%), no such data is available in the post-partum period. Unlike in pregnancy, post-partum women are less likely to develop anaemia due to the replenishment of the previously depleted iron stores and the relative period of amennorhea minimizing iron loss through menstruation. However, several studies show that iron levels remain low among women who are not supplemented with iron post-partum and therefore are at an increased risk of developing anaemia[xiii,xiv]. Half of the women in the present study fell short of their RDA of iron, and after supplementation with 100 mg elemental iron, the iron intake still fell short for 20.7% women.

Calcium is an important mineral required for the growth and development of a newborn's bones and teeth. According to the National guidelines for calcium supplementation during pregnancy and lactation all women should be supplemented with at least 1000mg of Calcium/day[xv]. It was therefore not surprising that in this study almost half of the women still fell short of the recommended intake of calcium despite supplementation with 500 mg of calcium.

Also, there was a significant association between the post-natal period and nutrient intake. The consumption of

almost all nutrients both macro and micro improved 6 weeks following childbirth as compared to immediate post-partum except iron intake. This might be due to the role of prevalent cultural beliefs during the immediate postpartum period placing certain food restrictions and taboos on the woman. There was a decline in the iron intake with time partly because of discontinuation of iron supplementation following childbirth. This in turn puts a woman at greater risk for postpartum anaemia.

In the months following childbirth, there is a shift in focus from the mother onto the newborn hence advice regarding adequate post-natal diet and exercise is seldom provided. While there might be several unique barriers that a new mother faces which includes lack of time, child care difficulty, early return to work and so on, optimum focus and supportive strategies should be developed to promote healthy eating in the post-natal period as well.

Recommendations: The postpartum period is a time when self-care can be affected and consequently, nourishment too. The results of this study shows a worryingly low nutritional intake among rural postnatal women, both in terms of macro and micro-nutrients.

The lactation period provides an excellent opportunity to provide food and nutrition education, because mothers are receptive to advice during this time and because of greater health seeking behaviour for the child. Strategies should focus on addressing prevalent food taboos and ensuring provision of adequate nutritional supplementation in the postpartum period. Furthermore, future studies are necessary to explore the relationship between socio-cultural practices and dietary habits among these women.

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A study to assess the prevalence of dyspepsia among undergraduate medical students of a rural medical college- A cross sectional study.

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ABSTRACT

Background: Dyspepsia is a common gastrointestinal disease worldwide with a prevalence ranging from 7 to 40%. Dyspepsia has been studied among the general public, but little is known of factors associated with dyspepsia among medical students. Objective: the study was started with objectives to find the prevalence of dyspepsia and to evaluate the association between various factors associated with dyspepsia among medical students. **Methodology:** A cross-sectional study conducted among 214 medical students at a rural medical college, Bangalore for six months and data collected regarding demographic profile, dietary factors and lifestyle factors through pretested semi structured questionnaire and Dyspepsia was assessed by Short from Leeds Dyspepsia questionnaire through interview. Data entered using Microsoft Excel and analyzed using SPSS software. Descriptive and inferential statistics were applied. **Results:** The mean age of the study participants is 19.8 years. A total of 43 (20.1%) respondents reported with dyspepsia. There was a significant association between mixed diet and Females with dyspepsia ($p<0.05$). **Conclusion:** The importance of improving lifestyle and dietary factors associated with dyspepsia and risk factors should be emphasized. Further studies are needed on dyspepsia in a larger cohort of students in order to fully understand the complexity of this problem and be able to generalize the findings to other cohorts.

Key Words: Dyspepsia, Medical students, heart burn, regurgitation

INTRODUCTION

Dyspepsia is a common problem more commonly known as heartburn or indigestion which is defined as one or more of the following symptoms like postprandial fullness, early satiation or epigastric pain or burning for at least 3 months in the past year. The prevalence of dyspepsia could be more due to the interaction of various health and lifestyle factors characterized by abdominal pain, centred more in the epigastrium usually combined with other gastrointestinal disorders. [1] Previously considered one of the nervous disorders" along with hypochondria and hysteria, came to be defined as a "pain or discomfort centred in the upper abdomen. [2, 3]Rome III defines dyspepsia as postprandial fullness, early satiation, and epigastric pain or burning for at least three months in the previous year. [4] Organic dyspepsia shows evidence for a known pathophysiologic mechanism like ulcer disease or a tumour mass for its symptoms.[5] Correlating the symptoms of dyspepsia with diet and aetiology in the patient with dyspepsia within our environment is unclear. The global prevalence of uninvestigated dyspepsia differs from 7% - 45%, the difference in the exact definition of the study method partly accounting for the variation. The prevalence of self-reported functional dyspepsia is 11% - 29.2%. The risk factors for dyspepsia are psychological disturbances, environmental factors, lifestyle habits e.g. smoking, increased caffeine batch, and consumption of non-steroidal anti-inflammatory drugs like Aspirin which is more relevant to ulcer dyspepsia .[6]

There are various risk factors exacerbating dyspepsia which are identified in various studies which include stress, diet, health and lifestyle. Stress can also be an independent risk factor as it varies as the year progress.[7] In India, no extensive research has been done in the past about the prevalence of dyspepsia and the factors associated with it. This prevalence study and factors influencing the occurrence of dyspepsia helps in improving the health of affected students and in increasing quality of life by appropriate preventive measures. In addition, it can open doors for further research in the area of dyspepsia. Hence, this study was conducted to assess the prevalence of dyspepsia among

medical students of a rural medical college and to determine the association between dyspepsia and socio-demographic characters, lifestyle and dietary factors influencing dyspepsia.

MATERIAL & METHODS

It was a cross-sectional study carried in a medical college of rural Bangalore among medical students for a period of 6 months from Jan 2018 to July 2018. The overall pooled prevalence of uninvestigated dyspepsia was 21%, with an error of 6% sample size was calculated which was around 185 rounded off to 200.[5]A pretested semi-structured questionnaire was used to assess the socio-demographic profile of study participants and to assess the dyspepsia status Short-Form Leeds Dyspepsia Questionnaire was used. The Short-Form Leeds Dyspepsia Questionnaire is a reliable, valid and responsive self-completed outcome measure for quantifying the frequency and severity of dyspepsia symptoms, which is shorter and more convenient than the Leeds Dyspepsia Questionnaire.[8] The data collected was entered in Microsoft Excel and analysed using SPSS v 22(IBM Corp). Results were expressed in percentage and association between various factors was assessed by Chi-square test with p-value defined significant less than 0.05. Medical students aged 18 to 25 years were included and those participants on long term Proton Pump Inhibitors or diagnosed with medical ailments like functional dyspepsia and gastric ulcer were excluded.

RESULTS

Table 1:-Distribution of the socio-demographic profile of study participants

Characteristics		Frequency (n=214)	Percentage
Age (In Years)	17-19	105	49.1
	20-22	86	40.2
	23-25	23	10.8
Sex	Male	66	30.8
	Female	148	69.2
Type Of Family	Nuclear	192	89.7
	Joint	22	10.3
No. Of Family Members	Less than 4	147	68.7
	More than 4	67	31.3
Type Of Diet	Veg	57	26.6
	Mixed	157	73.4
Alcohol Consumption	Yes	21	9.8
	No	193	90.2
Smoking	Yes	7	3.3
	No	207	96.7
Regular Intake Of NSAIDS	Yes	13	6.1
	No	201	93.9

Table 1 describes the distribution of participants according to socio-demographic characteristics. The mean age of the respondents was 20 years. Out of 214 study participants majority were females. Among participants, most of them 192(89.7%) belonged to nuclear family rest 22(10.3%) belonged to the joint family. Among 214 study participants majority had a mixed type of dietary pattern 157(73.4%), 21(9.8%) were consuming alcohol occasionally, 7(3.3%) were smokers and 13(6.1%) were regular in takers of NSAIDS.

Table 2 shows Responses of Participants to the Short-Form Leeds Dyspepsia Questionnaire in the Frequency and Severity of Each symptom. Table 3 shows the prevalence of Dyspepsia among study participants. It was observed that 43 (20.1%) reported dyspepsia out of a total of 214 participants. Table 4 shows the association between socio-demographic characteristics and dyspepsia.

Among the participants with dyspepsia, majority 36(83.7%) were female participants and this association between gender and dyspepsia observed was statistically significant with a p-value of 0.02. 41(21.3%) of participants belonging to Nuclear Family were found to have dyspepsia however the association was not statistically significant. Vegetarians have to found to have dyspepsia prevalence of 19(33.3%) more than participants with mixed type of diet pattern. The association between diet pattern and dyspepsia was found to be statistically significant with a p-value of 0.0004. Even though there was higher percentage alcohol consuming found to be having dyspepsia when compared to non-alcoholics 37(19.2%) there was no statistically significant association between alcohol consumption and dyspepsia in the present study. In respect to smoking, 3 (42.8%) were smokers and 40(19.3%) were non-smokers and the association between smoking and dyspepsia observed was not statistically significant. About 5(42.8%) of participants were regular takers of NSAIDS and there was no significant association between Regular intake of NSAIDS and dyspepsia.

DISCUSSION

The present study was a cross-sectional study conducted amongst 214 students at a rural medical college of Bangalore, Karnataka for a period of 6 months from Jan 2018 to July 2018 to assess the prevalence of self-reported dyspepsia among medical students. The association between Dyspepsia and socio-demographic, dietary and lifestyle factors were analysed. In our study, the mean age of the respondents was 19.8 years.

In a study conducted by Novis et al among students showed three students who developed dyspepsia followed with duodenal ulcers attributed to high acid secretion levels with more female preponderance observed.[10] A study of functional dyspepsia among the ethnic Malays in a primary care setting conducted by Yeong Yee Lee found results in which females were more

Table 2- Responses of Participants to The Short-Form Leeds Dyspepsia Questionnaire in Frequency and Severity of Each Symptom

Short Form Leeds Dyspepsia Criteria		Not At All	Less Than Once A Month	Between Once A Month & Once A Week	Between Once A Week & Once A Day	Once A Day or more
Indigestion	Frequency	58 (27.1%)	104 (48.6%)	41(19.2%)	9 (4.2%)	2(0.9%)
	Severity	130 (60.7%)	59 (27.6%)	18 (8.4%)	6 (2.8%)	1(0.5%)
Heartburn	Frequency	115 (53.7%)	81 (37.9%)	17 (7.9%)	1 (0.5%)	0
	Severity	172 (80.4%)	36 (16.8%)	5 (2.3%)	1 (0.5%)	0
Regurgitation	Frequency	83 (38.8%)	105 (49.1%)	19 (8.9%)	5 (2.3%)	2(0.9%)
	Severity	164 (76.6%)	37 (17.3%)	11 (5.1%)	1 (0.5%)	1(0.5%)
Nausea	Frequency	86 (40.2%)	88 (41.1%)	29(13.6%)	10(4.7%)	1(0.5%)
	Severity	149 (69.6%)	41 (19.2%)	16 (7.5%)	7 (3.3%)	1(0.5%)

Table 3: Prevalence of Dyspepsia based on Leeds Self-Reported Dyspepsia questionnaire

	Frequency	Percent
Yes	43	20.1
No	171	79.9
Total	214	100

Table 4- Association between Dyspepsia and socio-demographic factors, dietary and lifestyle factors.

Characteristics		Dyspepsia Yes	Dyspepsia No	p Value
Sex	Male	7 (10.6%)	59 (89.4%)	**0.02**
	Female	36 (24.3%)	112 (75.7%)	
Type of Family	Nuclear	41 (21.3%)	151 (78.7%)	0.17
	Joint	2 (9.1%)	20 (90.9%)	
Family Members	Less than 4	9 (24.3%)	28 (75.7%)	0.49
	More than 4	34 (19.2%)	143 (80.8%)	
Diet Pattern	Veg	19 (33.3%)	38 (66.7%)	**0.001**
	Mixed	24 (15.3%)	133 (84.7%)	
Alcohol Consumption	Yes	6 (28.6%)	15 (71.4%)	0.3
	No	37 (19.2%)	156 (80.8%)	
Smoking	Yes	3 (42.8%)	4 (57.2%)	0.12
	No	40 (19.3%)	167 (80.7%)	
Regular Intake Of NSAIDS	Yes	5 (38.5%)	8 (61.5%)	0.08
	No	38 (18.9%)	163 (81.1%)	

chi-square test

likely to have Functional Dyspepsia attributed to few psychosocial factors compared with men.[11] The present study also showed female participants having higher prevalence of dyspepsia which was statistically significant. In our study, it was seen that 46.2% of participants had experienced a feeling of heartburn and 19.6% reported that this symptom interfered at least once or more their normal activities such as eating, sleeping, work and leisure over the last two months and 18 out of 43 dyspeptic patients (41.2%) had experienced heartburn. Heartburn related to dyspepsia, 41.8% who had this symptom also suffered from Dyspepsia and 83.0% who reported regarding the heartburn interference with their normal activities, had dyspepsia. A study done on functional heartburn and functional dyspepsia stated there is a high prevalence of dyspeptic complaints such as epigastric burning in patients diagnosed with functional heartburn.[12]A retrospective study done by Lin et al on belching in dyspepsia and GERD evaluated that 64 of 78 of dyspeptic patients, 82% had heartburn and concluded as belching is as common and as severe in patients with dyspepsia as it is in patients with GERD.[13] A study conducted in Karachi, Pakistan which included 350 students between the ages 17-24 years from six private universities of Karachi, three medical and three non-medical institutions using the diet and lifestyle 85-point score scale among medical students concluded that the knowledge, attitudes and practices of medical students knowledge did not necessarily lead to better practice .[14] According to Richter, despite common beliefs, most environmental factors such as smoking, alcohol, coffee or use of non-steroidal anti-inflammatory drugs are not important contributors to Dyspepsia patients' symptoms .[16] The present study also showed no significant association of dyspepsia with alcohol consumption or NSAIDS consumption. Advantage of using short self-administered questionnaires in routine care will improve the reliability of separation of reflux induced symptoms from true dyspepsia.[17] The present study did not use endoscopy intervention to diagnose Dyspepsia however study done by R.Johnsen et al showed a small number of

normal endoscopic findings in both those with and those without dyspepsia challenging the well accepted endoscopic and histological diagnostic criteria with relation to the upper gastrointestinal tract.[18]The present study has many limitations. The findings cannot be generalized to the whole medical student population as the study included only one medical school. Recall bias may be present because some parts of the questionnaire required the students to recall previous events in the past few months.

CONCLUSION: Majority of the participants were found to have dyspepsia. Although it's believed that alcohol, coffee or use of non-steroidal anti-inflammatory drugs can lead to dyspeptic symptoms however Specifically, the factors like female gender and vegetarian type of diet were highly associated with the increasing prevalence of dyspepsia amongst medical students.

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Dietary habits and frequency of consumption of food items among rural adolescent girls in Mandya

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ABSTRACT

Background: Nutritional status of adolescents in low and middle income countries like India is poorer compared to high income countries. There increase in prevalence of malnutrition around the globe and poor diet is also adding up to the increasing burden of noncommunicable diseases. **Objectives:** To study dietary habits of adolescent girls; To study frequency of consumption of different food items. **Methodology:** This is a cross sectional study conducted in rural field practice area of department of Community Medicine, Mandya Institute of Medical sciences, Mandya. Data was collected using pretested semi structured questionnaire and analyzed for frequencies and percentages. **Results**: Total adolescents included in this study were 302. More than half of them consuming mixed diet and only around 50% consumed regular meals. The food consumption among adolescent girls was deficit in both calories and protein. Deficit was around 1/3rd and it was more in the age group of 16-19 years for both calories and protein. Ragi was consumed on daily basis and sunflower oil was most commonly used. Around 1/4th of them consumed junk foods on daily basis. **Conclusion:** Dietary habits of adolescents was poor and irregular. It lacked regular consumption of fruits and vegetables.

Key Words: dietary habits, adolescent girls, nutrition

INTRODUCTION

There are around 1.2 billion adolescents in the world according to World health Organization statistics and major chunk is in developing countries. As per 2011 census there are about 25.3 million adolescents in India which accounts for 20.9% of the population.[1,2] Adolescence is a period during which major changes in stature, bone mass and 50% of adult weight gain occurs (physical, biological, psychological growth and development). Growth and prosperity of country depends on nutritional status and development of adolescents. There is a relationship between nutritional status and dietary intake, dietary habits, practices etc. With some consuming only specific food items like rice is staple diet in some parts of country they suffer from nutritional deficiencies.[3]

Diet and health are interrelated. Nutritional status of adolescents in low and middle income countries like India is poorer compared to high income countries. There increase in prevalence of malnutrition around the globe and poor diet is also adding up to the increasing burden of non-communicable diseases. Nutritional status of adolescents effect the future generations leading to increasing mortality and morbidity among new-borns, u-5 children and maternal mortality and morbidity.[4]

Snacking energy dense foods, skipping meals/irregular meals, increased consumption of fast foods and less frequent consumption of fruits and vegetables are commonly seen habits among adolescents.[5,6]

Appropriate and adequate dietary intake and healthy dietary habits during adolescence not only important for their immediate growth and performance but will have impact on their long term health. There is wide variation in dietary habits among different communities and dietary habits of adolescents are affected by food habits of their family and community. Other factors like Socio-economic status, religion, customs, traditions etc also effects the dietary habits of the adolescents.[7] Assessment of dietary habits and food frequency pattern of adolescent girls will help in determining pattern and adequacy of food consumption. This study was conducted with the objectives;To study dietary habits of adolescent girls; To study frequency of consumption of different food items

METHODOLOGY

The present study is a cross sectional study, was conducted in the rural field practice area of the Department of Community Medicine, MIMS, Mandya. It was a cross sectional study conducted between August 2014 – July 2015. Adolescent girls in the age group of 10-19 years under the purview of Rural health training center were included in the study by simple random sampling of the villages under the purview of

RHTC. RHTC has 18 villages under its purview and total population is 14,303. The sample size was calculated considering prevalence of malnutrition as p = 57% based on the previous literature, q is (100 – 57).[8] The permissible error of the estimate (l) was set at 10%.

The villages were in listed and were selected randomly for inclusion in our study. House to house visit was done in the selected villages till the required sample size of 302 was met. Where more than one adolescent girl were found in the house one of them were selected randomly and included in our study. The adolescent girls and their parent/guardian were explained about the study and those who gave informed consent for the study; data regarding socio-demographic characteristics was obtained by interview method using a predesigned and pretested semi structured questionnaire.

Questionnaire consisted of two parts. Part 1: socio demographic characteristics and part 2: dietary habits and frequency of consumption. For determining the intake of calories and fat, 24hours recall method was used and excess or deficit consumption was determined. To assess the dietary habits of the adolescent girls, in addition to frequency of consumption of different food items, nature of diet, timing of the meal and frequency of meals was taken into consideration. The participants who consumed both vegetarian and non-vegetarian food items including egg were considered as consuming mixed diet.

The calorie and protein requirement for the adolescent girls were taken from National Institute of Nutrition, 2011 guidelines. The quantity consumption for calculating calorie and protein intake was considered in approximation as per the data provided by the adolescent girls and exact measurement was not done. The energy and protein intake was calculated according to the nutritive value of common Indian foods by NIN, Hyderabad.[9] Data was entered in Microsoft excel sheet and analysed for proportions.

RESULTS

Table 1: Socio demographic characteristics of study subjects

Socio demographic variables		Number	Percentage
Age group in years	10-12	53	17.6
	13-15	137	45.3
	16-19	112	37.1
Education	Primary school	61	20.2
	High school	152	50.3
	College	89	29.5
Socio economic status	Class II	23	7.6
	Class III	126	41.7
	Class IV	101	33.7
	Class V	51	16.7

Table 1: Among 302 adolescent girl's maximum number of adolescent girls were in the group of 13 to 15 years (45.3%), followed by 16-19 years (37.1%) and 10-12years (17.6%) respectively. Most of the adolescent girls very Hindu by religion (97.4%). Socio economic status (SES) was assessed by modified B G Prasad's classification. Three fourth of the adolescent girls belonged to SES class III and IV i.e. 126 (41.7%) and 101 (33.7%) respectively. Less than 10% belonged to SES class II (7.6%) and SES class I (0.3%).

Table 2: Distribution of adolescents according to nature of diet and frequency of food consumption

Variables		Number	%
Nature of diet	Vegetarian	46	15.2
	Mixed diet	256	84.8
Timing of meal	Fixed	152	50.4
	Irregular	150	49.6
Frequency of food consumption	Twice a day	26	8.52
	Thrice a day	110	36.7
	2-3 times a day	104	34.5
	Four times a day	5	1.5
	> Four times a day	57	18.8

Out of 302 adolescent girls, all of them were either doing or had completed primary schooling, 4 (1.3%) of the adolescent girls had discontinued high school and had rejoined after a year or more. 7 (1.9%) who were in college had similarly discontinued their studies in between. 15 (5.1%) adolescent girls were presently not pursuing their studies.

Table 2: Among 302 adolescent girls, maximum were consuming mixed diet (84.8%) and only 15.2% of them were vegetarians by diet. Half of the adolescent girls consumed meals at a fixed time and half the adolescent girls consumed meals on irregular timing. 1/3rd of the adolescent girls consumed meals three times a day and other 1/3rd consumed 2-3 times a day. Very few (1.5%) of them consumed meals four times a day and 1/5th of the adolescent girls (18.8%) consumed meals more than four times a day.

Table 3: The calorie and protein requirement for the adolescent girls were taken from National Institute of Nutrition, 2011 guidelines. The energy and protein intake was calculated according to the nutritive value of common Indian foods by NIN, Hyderabad. The calorie & protein intake were deficit in all the age groups. For the age group between 10-12 years the energy and protein intake were deficit by 29.2% and 21.7% compared to RDA. The calorie and protein intake of the adolescent girls for the age group between 13-15 years were deficit by 38.9% and 28.6%. For the age group between 16-17 years the calorie and protein intake was deficit by 41.8% and 33.6% and 32.5% & 32.7% in 17-19 years age group respectively.

Table 4: The study subjects consumed items like rice almost every day and more than 50% of them consumed ragi on daily basis. When frequency of consumption of pulses was considered the consumption of bengal gram and black gram was more frequent than red gram dhal and green gram dhal.

Table 3: Energy and protein consumption by adolescent girls

Age (Years)	Energy (kcal/day)			Protein (g/day)		
	RDA	Mean ±2SD	Deficit (%)	RDA	Mean±2SD	Deficit (%)
10-12	2010	1335.5±88.51	29.2	40.4	25.5±6.13	21.7
13-15	2330	1303.1±120.19	38.9	51.9	30.5±6.54	28.6
16-17	2440	1306.8±113.80	41.8	55.5	30.2±6.67	33.6
17-19	2230	1322.6±183.4	32.5	55	30.8±6.23	32.7

Table 4: Consumption frequency of various food items by adolescent girls

Food items	Frequency of use				
	Daily	Weekly	Monthly	Occasionally	Never
Cereals					
Rice	302 (100)	0	0	0	0
Wheat	21 (7)	220 (72.8)	37 (12.3)	18 (6.0)	6 (2.0)
Ragi	151 (50.0)	80 (26.5)	16 (5.3)	22 (7.6)	29 (9.6)
Maize	0	9 (2.9)	32 (10.6)	135 (44.7)	120 (39.7)
Pulses					
Red gram dhal	76 (25.2)	123 (40.8)	60 (19.9)	27 (8.9)	16 (5.3)
Bengal gram dhal	51 (16.9)	160 (53)	59 (19.5)	27 (8.9)	5 (1.7)
Black gram dhal	24 (7.9)	164 (54.3)	77 (25.5)	27 (8.9)	10 (3.3)
Green gram dhal	41 (13.6)	118 (39.1)	73 (24.2)	52 (17.2)	18 (6.0)
Green leafy vegetables	143 (47.4)	119 (39.4)	18 (6.0)	15 (5.0)	7 (2.3)
Other vegetables	54 (17.9)	135 (44.7)	68 (22.5)	42 (13.9)	3 (1.0)
Roots and tubers	61 (20.2)	129 (42.7)	67 (22.2)	40 (13.2)	5 (1.7)
Fruits	123 (40.7)	124 (41.1)	34 (11.3)	16 (5.3)	5 (1.7)
Milk and its products	176 (58.3)	74 (24.5)	21 (7.0)	12 (4.0)	19 (6.3)
Eggs	24 (7.9)	141 (46.7)	62 (20.5)	32 (10.6)	43 (14.2)
Fleshy foods					
Mutton	1 (0.2)	68 (22.5)	135 (44.7)	31 (10.3)	67 (22.2)
Chicken	1 (0.3)	86 (28.5)	115 (38.5)	35 (11.6)	65 (21.5)
Fish	0	18 (6.0)	67 (22.2)	90 (29.8)	127 (42.1)
Beef	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	298 (98.7)
Pork	5 (1.7)	1 (0.3)	1 (0.3)	1 (0.3)	294 (97.4)
Jaggery	90 (29.8)	152 (50.3)	31 (10.3)	26 (8.6)	3 (1.0)
Oils					
Ground nut	34 (11.3)	39 (12.9)	16 (5.3)	93 (30.8)	120 (39.7)
Sunflower	254 (84.1)	19 (6.3)	12 (4.0)	14 (4.6)	3 (1.0)
Pickle	129 (42.7)	102 (33.8)	35 (11.6)	26 (8.6)	10 (3.3)
Bakery items	77 (25.5)	147 (48.7)	47 (15.6)	26 (8.9)	4 (1.3)
Road side chats	46 (15.2)	105 (34.8)	81 (26.8)	55 (18.2)	15 (5.0)

The consumption frequency of vegetables was less than 50% on daily basis & 39.4% consumed GLV once a week. 2.3% of adolescent girls never consumed GLV. There was no much difference in the consumption of other vegetables and roots & tubers. 40.7% of adolescent girls consumed fruits every day and 1.7% never consumed fruits. 8.0% of adolescent girls consumed egg on daily basis and less than 50% consumed egg once a week. 14.2% of adolescent girls never at egg.

The frequency of consumption of chicken and mutton on daily and also weekly basis was almost same. Very few (2.5%) of adolescent girls consumed pork and beef. Around 50% consumed jaggery once a week and about 30% consumed it every day. Most of the adolescent girls (84%) consumed sunflower oil and only 11.3% consumed groundnut oil.

DISCUSSION

In our study maximum number (84.8%) of the study subjects were consuming mixed diet. About half of them consumed meals on fixed timings and half of them consumed meals on irregular basis. Around 1/3rd of adolescent girls consumed meals 2-3 times a day (34.5%) and thrice a day (36.7%). Only around 18.8% of them consumed meals more than four times a day. The food consumption among adolescent girls was deficit in both calories and protein. Deficit was around 1/3rd and it was more in the age group of 16-19 years for both calories and protein.

A study b S Chowdary et. al, among rural adolescents girls, majority of study subjects followed mixed diet and around 36.6 % ate 3 meals a day. Only around half of them consumed meals on regular basis. The findings of this study are similar to finding of our study.

Adolescent girls in our study consumed rice on daily basis and half of them consumed ragi every day. Most commonly used pulse was red gram dhal and bengal gram. Only about 13.1% of them consumed green leafy vegetables every day and 39.1% consumed leafy veg at least once a week. About half (46.7%) of the adolescent girls consumed egg once a week. About 1/4th of them consumed chicken and mutton at least once a week and about 40% of them consumed once a month. About 60% of them consumed milk and milk products on daily basis. Sunflower oil was the most commonly used oil and only about 11.3% of them consumed ground nut oil.

About 1/4th of the adolescent girls consumed bakery items every day and around 50% of them consumed once a week. About 1/3rd of them consumed pickle and road side chats once a week. .

A study was conducted by Puri S et. al among urban and rural high school adolescents of Chandigarh. The study found that about 56.7% rural adolescents were vegetarians; only 12.8% of them consumed vegetables on daily basis and about 15.9% skipped breakfast. About 58.8% of the study subjects preferred fast food items over the regular meals. Among the junk food items, samosa (42.4%), tikki/chat (39.7%), noodles (25.4%), burger (24.5%) and pizza (23.3%) were preferred by most of the adolescents.[10]

Vipna Kumari Bhandari conducted a study on nutritional status, dietary practices and nutrition related beliefs of high school girls in urban area of Bangalore city. 57.3% girls ate green leafy vegetables once a week and 18% of girls did not consume non vegetarian food. 85.3% did not take breakfast and they skipped it and 90.7% girls eat while watching TV.[11]

Srivastava S P conducted a study on dietary practices and beliefs among adolescent girls in Bihar. A vast majority of respondents were consuming three major meals in the day. This practice was same in both high and middle SES (92% to 100%) whereas in the low SES substantial proportions (23.4% to 32%) were eating only two or lesser meals per day. The practice of snacks interspersed between the major meals was also almost universal in high and middle SES and was less frequent in the low SES. This study also compared the dietary practices of adolescents in rural area and found that about half (54.5%) of the subjects were consuming only two or less major meals per day. Regular intake of non-vegetarian food was documented in only 4.5%, snacks were taken by about one-third (36.8%). Boys were given a preference for milk and non-vegetarian foods.[12]

Conclusion: Adolescents have poor dietary habits and most of them as seen in different studies among different parts of country are consuming less calories and protein than the recommended dietary allowances. As dietary habits and food choices of adolescents will have large impact on their long term heath appropriate guidance and importance regarding regular food consumption and choosing the right food may have a large impact on improving their overall health status.

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Medication adherence and associated factors among individuals with non-communicable diseases registered for care in primary health centers of Villupuram district, South India

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ABSTRACT

Introduction: Early detection and compliance to prescribed treatment is the cornerstone to avert life threatening complications among those with non-communicable diseases (NCD). Medication adherence is a critical determinant for ideal control status in Non communicable diseases. Assessing adherence to medication and its correlates can help in devising effective strategies to improve medication adherence. **Objectives:** To assess adherence to prescribed medications and associated factors among diabetic and/or hypertensive patients registered in NCD clinic of selected PHCs of Tamil Nadu, South India. **Methodology:** A facility based cross-sectional analytical study was conducted in six conveniently selected PHCs of Villupuram district, Tamil Nadu. The individuals with hypertension and/or diabetes, registered and received NCD drugs for more than four weeks were included. All eligible individuals attending the clinic during study period were included. The medication adherence was assessed using MMAS-8 questionnaire. The data was entered in EpiData software V 3.1 and analyzed using Stata version 11.0. **Results:** Of the 1406 participants, the mean (SD) age was 56.3 (±11.4) years; 831 (59.1%) were females. Only diabetes was found in 340 (24.2%), 806 (57.3%) had only hypertension and 260 (18.5%) had both diabetes and hypertension. Low adherence to medication was seen in 203 (14.3%, 95% CI (9.8%, 19.9%) of the study participants. Having only hypertension (PR-1.5, 95%CI-1.1–2.1)), consuming more than two class of drugs (Prevalence ratio PR-1.7, CI-1.1–2.4) and more than four (PR-2.8, CI-2.3-3.6) were independently associated with low adherence. **Conclusion:** Around one out of six individuals registered in NCD clinics of PHC had low adherence to prescribed medication. Those having higher number of concomitant drugs to consume were more likely to have low adherence.

Key Words: Diabetes, Hypertension, Adherence, Non adherence, Primary health care, medication.

INTRODUCTION

Non Communicable Diseases contribute to 43% of overall disease burden in the world and are expected to be responsible for 60% of the disease burden and 73% of all deaths by 2020.[1] Hypertension and diabetes are the common chronic morbidities which can lead to life-threatening complications like cardiovascular diseases and stroke.[2] Globally about 392 million people live with diabetes and the number is expected to rise to 592 million by the year 2035.[3] Of the total estimated, about four-fifths live in Low and Middle Income Countries (LMIC). International Diabetes Federation (IDF) estimates that diabetes accounts for 14.5% of all-cause mortality among people aged between 20 and 79 years.[3] There is high healthcare spending to treat diabetes and prevent its complications; estimated to be 673 billion USD and projected to increase by 20% in 2040.[4] World Health Organization (WHO) rates hypertension as one of the most common cause of premature deaths worldwide.[5] Hypertension independently accounts for almost 57% and 24% of deaths due to stroke and cardiovascular diseases respectively.[5] Global Burden of Diseases (GBD) rated hypertension as the second important cause of mortality placed only next to under-five malnutrition in South Asia.[6]

Like any other developing country, India is facing the double burden of disease with high burden of communicable and non-communicable diseases.[7] India is home for nearly 69.9 million people with diabetes mellitus, only next to China.[3] The burden of diabetes has increased significantly over the last few decades. Similarly, there is high burden of hypertension in the country with estimated prevalence of 29.2% among adults.[8] With increasing burden of the diseases and premature mortality associated with non-communicable disease like diabetes, National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched.[9] The program advocates delivery of care to the patients with NCD at the Primary Health Centres (PHCs), with timely referral to secondary and tertiary hospitals. The patient registered in NCD clinics are clinically assessed once in a month and drugs are prescribed for duration of one month in PHCs. However, NPCDCS has not devised and implemented any standard operating procedures for assessing adherence to medication among NCD patients.

The definition of the term "adherence" is "the extent to which a person's behavior such as taking medication, following a diet and/or executing lifestyle changes corresponds with the agreed recommendations from a health care provider".[10] On the other hand, "Non-adherence" to treatment acts by increasing hospitalization, mortality and out of the pocket expenditure amongst patients with diabetes and/ or hypertension.[11] A study conducted at a tertiary care hospital in South India among diabetic in-patients showed that only 49.3% were adherent to prescribed medications.[12] A community based study among hypertensive patients in South India showed that 45.8% were having low adherence.[13] Whereas studies conducted in single center among NCD patients showed 17.5% to have low adherence to medication.[14]

In India, studies assessing adherence to medication among patients with diabetes and hypertension are mostly limited to patients attending tertiary care facilities.[11-15] But, it is important to assess adherence to treatment and its correlates in those patients attending PHCs as most of them are yet to develop complications. Even though few studies have been conducted in PHCs, they are all limited to single PHCs[16]. Identifying the non-adherent patients and factors associated with non-adherence will help in guiding targeted interventions in future among these patients to improve adherence and avert complications that may arise due to non-adherence.

In this context, the present study was conducted among patients with diabetes and/or hypertension registered in NCD clinic at six Primary Health Center (PHC) of Villupuram HUD, Tamil Nadu, to assess a) the adherence to prescribed medications for diabetes and/or hypertension b) the socio-demographic and treatment characteristics associated with the low adherence

METHODOLOGY

Study Design and Setting

In 2017, during the months of June to August facility based cross-sectional analytical study was conducted in selected primary health centers of Villupuram district in the state Tamil Nadu, India. Tamilnadu is one of the well performing states in providing health care in southern part of India. Villupuram Health unit District (HUD) caters to the healthcare needs of 16,11,283 individuals. Villupuram HUD comprises of 11 Block Primary Health Centres (BPHCs), 43 Primary Health Centres (PHCs), 3 Urban Primary Health Centres (UPHCs) and 293 Sub Centres functioning under Directorate of Public Health (DPH) Tamilnadu Government.

Among those 43 PHCs, six PHCs were selected based on convenience of access of 60 kms from study headquarters (Tertiary care Hospital) as it is single investigator study. PHCs provide outpatient services from 8 am to 4.30 pm and emergency services in remaining hours. The NPCDCS was implemented in the Villupuram HUD during the year 2011..

Each PHC has a separate NCD wings manned by a NCD staff nurse supervised by the medical officer. Patients registered for care every month for follow up and for medications which are given for a month.. During the visit the patients are reviewed and the updated in the comprehensive patient record by the attending medical doctor. The card has details of the patient like socio demographic details, screening results, life style modifications adopted, co morbidities, counselling provided, follow up details, date and result of lab investigations, details of drugs taken and referral details of the patient. The patients are advised regarding need for regular follow-up visits and lifestyle modifications to combat non communicable disease. The health care providers educate patients regarding dose and regimen of the prescribed medication to be followed during the course of next four weeks.

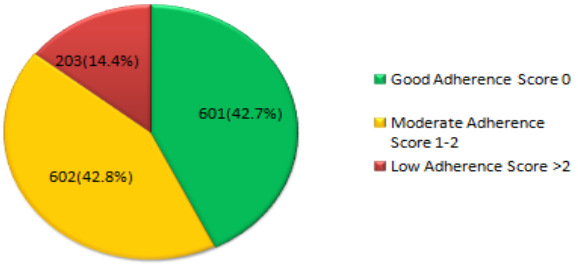
Study population:

We included all the patients with either diabetes and/or hypertension who are already registered and attending NCD clinic at the six PHCs who had at least four weeks of treatment prior to the date of interview. The minimum sample size was calculated to be 628, assuming 17% to have low adherence[14], 3% absolute precision and 95% confidence limit. However, all the patients attending the clinic during month of June and August were included in the study.

Study tool and Study variables:

Pretested, semi-structured interview schedule was used to collect information. Pre testing was done in four patients who had both diabetic and hypertension, three patients who had diabetes alone & three with hypertension alone. No major changes needed. The interview schedule had 2 components socio-demographic details and adherence to medication. The component of socio-demographic details included age, gender, education, occupation, community, marital status and also lifestyle behaviours like alcohol use and tobacco use.

Figure-1: Adherence to medication among NCD patients in the selected PHC's of Villupuram , N=1406



Low adherence to medication- 203 (14.4%, 95% CI- 9.8%-19.9%)

The treatment details had variables like type of morbidity (disease type), duration of treatment, number of drugs received. The details of treatment received were extracted using NPCDCS patient follow-up card. The adherence to medication was captured with the eight-item Morisky Medication Adherence Scale (MMAS-8) which has eight questions and was graded as low adherence, moderate adherence and good adherence. MMAS-8 is validated in India and other parts of world in different languages with reliability value (α) of 0.83. MMAS scores can range from 0 to 8, with low adherence defined as MMAS scores less than 6; moderate adherence as scores of 6 to less than

Table-1: Socio-demographic characteristics & Morbidity Profile of NCD patients in the selected PHC's of Villupuram, March-2017 to August-2017, N=1406

Socio-demographic Characteristics & Morbidity Profile		Frequency (n)	Percentage (%)
Age(years)	**30-44**	261	18.6
	45-59	682	48.5
	≥60	463	32.9
Gender	**Male**	575	40.9
	Female	831	59.1
Education	**Illiterate**	734	52.2
	1-5th STD	212	15.1
	6-8th STD	150	10.7
	9-10th STD	130	9.3
	Intermediate and above	49	3.5
	Not Recorded	131	9.3
Occupation	**Farmer and Farm workers**	488	34.7
	Employed	89	6.3
	House wife	459	32.7
	Unemployed	115	8.2
	Others	255	18.1
Caste	**Forward Caste**	39	2.8
	Backward Caste	482	34.3
	Most Backward Caste	449	31.9
	Scheduled Caste	216	15.4
	Not Recorded	220	15.7
Alcohol use	**Yes**	64	4.6
	No	1096	77.9
	Not Recorded	246	17.5
Tobacco use	**Yes**	169	12.0
	No	1237	88.0
Disease type	**Hypertension only**	340	24.2
	Diabetes only	806	57.3
	Both	260	18.5
Disease duration (years)	**<1**	209	14.9
	1-3	466	33.1
	3-5	536	38.1
	>5	195	13.9
Regimen	**Once daily**	759	54.0
	Twice daily	581	41.3
	Thrice daily	66	4.7
Number of medication	**One to two**	565	40.2
	Three to Four	721	51.3
	More than Five	120	16.7

Table-2: Socio-demographic and Morbidity characteristics associated with low adherence among NCD patients in selected PHC's of Vilupuram HUD, N=1406

Characteristics	Frequency	Low Adherence n(%)	Unadjusted PR (95%CI)	Adjusted PR (95% CI)
Age (in years)				
30-44	261	30(11.5)	1.0	
5-59	682	107(15.7)	1.4 (0.9-2.0)	1.2 (0.9-1.7)
≥60	463	66(14.3)	1.2 (0.8-1.9)	1.1 (0.8-1.6)
Gender				
Male	575	74 (12.9)	1.0	
Female	831	129 (15.5)	1.2 (0.9-1.6)	1.0 (0.5-2.1)
Education				
Illiterate	734	111(15.5)	1.5 (0.9 – 2.5)	1.5 (0.9- 2.5)
1-5th STD	212	32 (15.1)	1.5 (0.8-2.7)	1.6 (1.1-2.5) †
6-8th STD	150	15 (10.0)	1.0	
9-10th STD	130	16 (12.3)	1.2 (0.6-2.4)	1.4 (0. 9-2.1)
Intermediate and above	49	7 (14.3)	1.4 0.6 – 3.3)	1.6 (1.1- 2.3)†
Not Recorded	131	22 (16.8)	1.7 0.9-3.1)	1.9 (1.1-3.0) †
Occupation				

Farmer and Farm workers	488	69 (14.1)	1.5 (0.8 – 2.7)	1.6 (0.7-3.7)
Employed	89	13 (14.6)	1.5 (0.7-3.2)	1.7 (0.7-4.0)
House wife	459	81 (17.7)	1.8 (1.1 – 3.3)	1.7 (0.7-4.7)
Unemployed	115	11 (9.6)	1.0	
Others	255	29 (11.4)	1.2 (0.6 – 2.3)	1.3 (0.5- 3.5)
Caste				
Forward Caste	39	3 (7.7)	1.0	
Backward Caste	482	47(9.8)	1.3 (0.4-3.9)	1.4 (0.2-8.1)
Most Backward Caste	449	99 (22.1)	2.9 (1.0-8.6)	2.8 (0.4-19.1)
Scheduled Caste	216	31 (14.4)	1.9 (0.6-5.8)	1.9 (0.3-12.0)
Not Recorded	220	23 (10.5)	1.4 (0.4-4.3)	1.4 (0.3-7.6)
Alcohol Use				
Yes	64	5 (7.8)	1.0	
No	1096	147 (13.4)	1.7 (0.7-4.0)	1.6 (0.5-4.8)
Not Recorded	246	51 (20.7)	2.7 (1.1-6.4)	2.0 (0.5-8.5)
Tobacco Use				
Yes	169	20 (11.8)	1.0	
No	1237	183 (14.8)	1.3 (0.8-1.9)	1.0 (0.6-1.7)
Disease Type				
Hypertension only	340	129 (16.0)	1.5(1.1-2.1)	1.5(1.1-2.1) †
Diabetes only	806	37 (10.8)	1.0	
Both	260	37 (14.2)	1.3(0.9-2.0)	0.9(0.7-1.1)
Disease Duration (years)				
<1	209	23 (11.0)	1.0	
1-3	466	74 (15.9)	1.4 (0.9-2.2)	1.4 (0.7-2.9)
3-5	536	69 (12.9)	1.2 (0.8-1.8)	1.2 (0.5-3.2)
>5	195	37 (19.0)	1.7 (1.1-2.8)	1.3 (0.5-3.9)
Regimen				
Once daily	759	98 (12.9)	1.0	
Twice daily	581	94 (16.2)	1.3 (1.0-1.6)	1.0 (0.7-1.4)
Thrice daily	66	11 (16.7)	1.3 (0.7-2.3)	1.2 (0.7-1.9)
Number of Medication				
One to two	565	55 (9.7)	1.0	
Three to Four	721	118 (16.4)	1.7 (1.2-2.3)	1.6 (1.1-2.4) †
More than Five	120	30 (25.0)	2.6 (1.7-3.8)	2.8 (2.2-3.6) †

PR-PREVALENCE RATIO †- SIGNIFICANT ASSOCIATION

8, and good adherence as a score of 8.[17-19]The questions were translated and back translated to Tamil and English respectively by two separate bi-linguistic persons for content verification. The interview schedule was administered by trained NCD Staff nurses who were well versed in local language Tamil. The study protocol was approved by the Institutes Ethics committee.

Operational Definitions:

Adherence to medication: Patient with scores of <6 were considered to have low adherence. Patient with scores of 6 to < 8 were considered to have moderate adherence. Patients having a score of 8 were considered to have good adherence.

Duration of Disease: Duration of either diabetes or hypertension whichever was detected first in the patient eg: Patient is having Hypertension and Diabetes since two years and one year respectively, then duration of disease is considered as two years.

Dosage: Patients dosage is considered Once Daily, Twice Daily or Thrice Daily if he/she is consuming at least one drug once in a day, two times a day or three times a day respectively.

Number of drugs: Total number of different drugs that the patient has been prescribed by attending medical doctor to consume per day.

Statistical methods

The data was entered in Epidata software V 3.1 and was analyzed using Stata 11 software. The continuous data like age, duration of disease and number of drugs received were converted into categorical data according to relevance. All the categorical data were presented as percentages. The association between low adherence and categorical variables like age group, gender, education status, occupation, and type of disease, duration of disease, dosage and number of drugs was tested using univariate binomial regression. The variables with p value less than 0.1 in univariate binomial regression were taken for generalized linear models and factors with p value was less than 0.05 were considered as statistically significant.[20] The strength of association was mentioned in terms of prevalence ratio (PR) with 95% CI.

RESULTS

Of the 1406 participants, the mean (SD) age was 56.3 (±11.4) years; 831 (59.1%) were females. Among participants, 734 (52.2%) were uneducated, 488 (34.7%) were homemakers and 482(34.3%) were belonging to

backward caste. Of the total, 64(4.6%) and 169(12.0%) participants reported current use of alcohol and tobacco respectively. Socio-demographic details of study participants are shown in Table1.

Of the total participants, 806(57.3%) had only diabetes, 340(24.2%) had only hypertension and 260 (18.5%) had both hypertension and diabetes mellitus. Of the total participants, 536(38.1%) had disease duration of 3-5 years and 466(33.1%) had disease duration of 1-3 years. Of the total participants, 759 (54.0%) were consuming drugs only once in a day and around 647 (46.0%) had to consume two to three drugs per day. Morbidity profile of study participants are shown in Table 1.

Low, moderate and Good adherence to medication was seen in 203 (14.4%) 602(42.8%) and 601(42.7%), participants respectively as shown in Figure 1. Low adherence to medication was seen in 203 (14.3%, 95%CI-9.8%-19.9%) of the study participants. The proportion of low adherence was found to be higher in those having only hypertension (16.0%) compared to those having only diabetes (10.8%) or having both disease conditions (14.2%) and was found to be statistically significant.

Similarly the proportion of low adherence was found to be higher in those consuming five to nine drugs per day (25%) compared to consuming three to four drugs (16.4%) or consuming one to two drugs (9.7%) and was found to be statistically significant. Other variables adjusted and not significant were age, gender, education, occupation, alcohol use, tobacco use, duration of disease and regimen. Disease type and Number of drugs/day were significantly associated with low adherence on adjusting for other factors. Having only hypertension (PR-1.5, (95% CI-1.1–2.1)), consuming more than two class of drugs (PR-1.7,(95% CI-1.1–2.4)) and more than four (PR-2.8,(95% CI-2.3-3.6)) were independently associated with low adherence as shown in Table 2.

DISCUSSION

Our study conducted among patients with either hypertension and/or diabetes in 6 Primary Health Centers (PHCs) showed that 14.4% of the study participants had low adherence to medication. Patients having only hypertension and consuming more number of drugs were found to be independent risk factors for low adherence to prescribed medication in our study.

Arulmozhi and Mahalakshmy, in a study from Puducherry using MMAS-8 scale reported low adherence to medication in 39% patients.[12]. This study was conducted among diabetes in-patients who have got complications and are admitted to hospital unlike in our study where patients are not having any complications. Steps taken to improve adherence in patients without complications like in our study can lessen the chances of them developing in the future.

Similarly another community based cross-sectional study conducted in a rural village of Tamil Nadu showed 75.9% of the hypertensive patients to be less adherent to medication (using MMAS-4).[21]. A community based cross-sectional study conducted in rural village of Kerala showed 74% of diabetic patients to be less adherent to medication (using MMAS-8).[22] The proportion of low adherence was found to be comparatively low in our study as the NCD staff Nurses have been stressed about the importance of Health education on life style modifications and how it helps in improving the treatment outcome. In the same study done in Tamilnadu, factors related to medication like increase in number and frequency of drugs were associated with low adherence.

The similar findings were reported seen in a single PHC study conducted in Puducherry, South India. A facility based cross-sectional study conducted in a public primary care clinic in China showed 32.6% of the hypertensive patients to have low adherence to medication.[23] As in our study MMAS-8 was used to assess adherence and a score of less than six was considered to be less adherent. Younger age, shorter duration of treatment and being employed were associated with low adherence. On the contrary in our study, patients with older age and longer duration of treatment had higher risk for low adherence.

The current study has a few strengths; firstly this study reported adherence among patients with diabetes and/ or hypertension attending a public, primary health center (PHC). The majority of these patients seek care only from PHC and also the national program promotes follow-up of these patients at PHC's. Hence, detecting the adherence level and its correlates at a PHC will help to find at risk groups for targeted interventions. Secondly Large Sample Size compared to other studies involving multiple primary health centers. Thirdly, using of cluster adjusted models with prevalence ratio to find the factors associated with low adherence. We used pretested questionnaire with validated MMAS-8 scale for adherence to medication; hence it has better internal validity and also comparability. Lastly using Epidata software V 3.1 for data entry for accurate data capturing.

As the interview was conducted by the healthcare provider, there might have been a social desirability in reporting non-adherence and we might have underestimated low-adherence to medication. To partly overcome this, the interviews were conducted on a one to one basis by the residing NCD staff Nurses after the patients purpose of visit is completed on the day of follow-up.

Our study has a few implication and recommendations. Firstly, the study results shows that there is a great need on the part of health care providers to not only prescribe medications but also make sure they are adherent to the prescribed drugs. Secondly, focused health education sessions addressing the importance of adherence to medications need to be carried out regularly other than routine Lifestyle modification advice provided. These sessions can be planned during the NCD clinic day which is now incorporated in all PHC's of the country. Thirdly, NPCDCS follow-up card has only one time entry regarding the life style behaviour of the patient like diet, physical activity, alcohol consumption, tobacco usage, etc. There can be an additional check box added in order to ascertain whether the patient had brought about the

recommended life style modification as per the counselling. Lastly, this study emphasizes the need for more studies addressing the cost-effectiveness of improvement in adherence and thus reducing the complications and also health care costs.

There are very few studies in these regions which explore the adherence to medication in hypertensive and diabetic patients that too in multiple centers at primary level. There is need for finding factors which are associated with low adherence. In our study, even educated individuals had low adherence to medication; hence qualitative studies will help to find the reason for this low adherence in educated. Without rectifying these reasons, health promotion segment of the national programs will not be able to deliver desirable treatment outcomes.

Conclusion

Among the diabetic and/or hypertensive patients though 85.3% of the study population showed moderate to good level of adherence, around one out of seven were found to be less adherent to prescribed medications in 6 PHCs of South India. Having only hypertension and consuming more number of drugs were identified independently as risk factors for low adherence to medication.

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Morbidity profile of patients attending Siddha clinics of Primary Health Centres in rural Puducherry

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ABSTRACT

World Health Organization (WHO) recommends mainstreaming of Complementary and Traditional systems of medicine as it is an affordable and culturally acceptable way of making heath care accessible to everyone. India is currently facing shortage of trained health workforce, especially in rural areas. One of the solutions suggested is to integrate the complementary and traditional systems of medicine as part of the Nation's health care system. In fact, AYUSH clinics have been operational in many PHC's in Tamil Nadu and Pondicherry for more than a decade now towards achieving UHC. **Objective:** To describe the morbidity profile of patients attending the Siddha clinics of PHCs in rural Puducherry. **Materials and methods:** A facility based cross-sectional study was conducted among the patients who had attended Siddha clinics at the 2 selected PHCs of Puducherry over a period of year. After obtaining necessary permissions, Centre-Based Health Records was accessed for demographic and disease profiling. Data was entered using EpiData Entry v3.1 and analysis was carried out using EpiData Analysis v2.2.2.182 44. Proportions were used to summarize categorical variables. **Results:** Among the 22069 people attending the siddha clinic, 10765 were females and 11299 were males. Majority are from the age group of 36-59(54.2%). There exists a statistical difference in morbidities with age groups and different genders (p value0.01). **Conclusion:** Among the patients attending selected Siddha centres, the common morbidities were Arthritis, Bronchitis, Neuritis, Acid peptic ulcer and Skin diseases.

Key Words: Siddha, Profiling, AYUSH, Primary health center.

INTRODUCTION

India, with a population of 1.21 billion, has a wide heterogeneity in terms of people's socio-cultural, linguistic and demographic backgrounds.[1] India's epidemiological transition is characterized by a shift from a situation of predominantly infectious diseases to a state of dual burden of diseases where both infectious and chronic non-communicable diseases coexist.[2]

The changes in disease pattern and burden require the health system to be prepared to handle the crisis of double-burden (CDs+NCDs) of diseases. But the existing health system of the country has not been able to satisfactorily cope up to and cater to the needs of this epidemiological transition. *Inadequate healthcare infrastructure* is part of the problem and *inadequate health workforce* is another problem the country faces. Manpower for health services has been described as the "heart of the health system in any country". As per NHP 2018, the total number of registered Allopathic Doctors (up to 2017) is 10,41,395. The lack of trained health professionals, which is markedly higher in rural areas, is considered the single most important issue hindering the progress towards achievement of Universal Health Coverage (UHC) in the country.[3] World Health Organization (WHO) has been recommending mainstreaming of Complementary and Traditional systems of medicine of the member nations as an affordable and culturally acceptable way of making heath care accessible to everyone.[4]

It has been nearly ten years since the initial attempts of integration of AYUSH systems at the PHC level began in India. There has been an evident interest to mainstream AYUSH, but very little research has been carried out regarding mainstreaming AYUSH systems in to the nation's public health care delivery system. For instance, we can cite any number of studies describing the morbidity profile of patients seeking Allopathy services at various levels of care. Yet, when we look at the AYUSH systems, the state is such that, we don't even know the basic demographics or morbidity profiles of patients attending these government-run AYUSH clinics. There is no reliable information regarding the potential reasons for the preference for AYUSH among those who avail services from these AYUSH clinics. Also, we have not systematically explored the satisfaction of patients availing services from AYUSH clinics. All this information is imperative to standardize and improve the care provided through AYUSH clinics, hospitals and facilities. Knowing

these becomes all the more significant as the government is planning to scale up the integration of AYUSH in to the public health care system. Further, before such integration, exploring the AYUSH caregiver's perspectives on the care provided by them will help the implementers to overcome the implementation challenges. Yet again, there has been no such research work carried out till date.

Hence, the current research aims to study the socio-demographic and morbidity profiles of patients attending the AYUSH clinics.

MATERIAL & METHODS

Study design: A cross-sectional descriptive study was conducted among the patients attending Siddha clinics of selected Primary Health Centres in Rural Puducherry. This study is a part of larger study exploring the morbidity profile of all age groups including children and elderly.

Study setting: The study was conducted in 2 rural PHCs of Puducherry district. The district of Puducherry is one of the four districts of the Union Territory (UT) of Puducherry in south India. With an area of 294 square kilometers, the district consists of 11 non-contiguous enclaves on or near the Bay of Bengal, the compact area being enclosed by the state of Tamil Nadu. According to the 2011 census, the district had a population of 950,289 with 69.16% people living in the urban areas41. The state-run healthcare service of Puducherry is provided by a total of 4 Community Health Centres (CHC), 27 PHCs and 52 Health Sub Centres (HSC). Out of the 27 PHCs, 12 are in urban areas and 15 in rural areas.

Study population: All patients who had attended the Siddha clinics at the 2 selected rural PHCs of Puducherry for a period of a year.

Ethical approval: The study was approved by the Institutional Human Ethics Committee, Mahatma Gandhi Medical College & Research Institute, Puducherry. Prior to initiation of the study, necessary permissions were obtained from the Directorate of Indian Systems of Medicine and Medical Officers, Puducherry.

Data variables and study tools: Centre-Based Health Records were utilized for demographic and disease profiling. For the study purpose, diagnoses of the patients were recorded as reported in the OPD record by the registered Siddha practitioner. Categorization of the morbidities was done as per the reporting format for Indian Medicine and Homeopathy recommended by Directorate of Indian Medicine and Homeopathy under the Ministry of Health and Family welfare, Puducherry.

Data entry and data analysis: Data was single entered using EpiData Entry v3.1 and all the analyses were carried out using EpiData Analysis v2.2.2.182.44. Proportions were used to summarize categorical variables. Chi square test was used to compare proportions and p value <0.05 was considered as statistically significant.

RESULTS

Among the 22069 people attending the siddha clinic 10765 were female and 11299 were males. Majority are from the age group of 36-59(54.2%). (Table 1) The overall morbidity profile of people attending the siddha clinic has been given in the Table 2.

Table 1: Age-Sex distribution of study population (N=22069)

Age in groups (years)	Male		Female		Transgender		Total	
	n	%	n	%	n	%	n	%
<18	701	6.2	852	7.91	0	0	**1553**	**7.04**
18-35	2159	19.11	2866	26.62	2	40	**5027**	**22.78**
36-59	6236	55.19	5883	54.65	1	20	**12120**	**54.92**
>60	2203	19.5	1164	10.81	2	40	**3369**	**15.27**
Total*	**11299**	100	**10765**	100	**5**	**100**	**22069**	**100**

** Percentages in the 'Total' row are row percentage and other rows depict column percentages.*

Table 2: Overall Morbidity Profile of patients attending Siddha PHCs (N=22069)

Broad Category/System*	Diseases/ Diagnosis	Total n (%)
Respiratory disorders	Sinusitis	914 (4.14)
	Bronchitis	2834 (12.84)
	Bronchial asthma	429 (1.94)
	Pulmonary tuberculosis	6 (0.02)
Gastro intestinal disorders	Acid peptic ulcer	1476 (6.68)
	Diarrhoea	225 (1.01)
	Food poisoning	3 (0.01)
	Ascites	8 (0.03)
Joint disorders	Arthritis	3308 (14.98)
	Cervical spondylitis	455 (2.01)
	Lumbar spondylitis	182 (0.82)
Neurological disorders	Neuritis	2107 (9.54)
	Sciatica	709 (3.21)
	Epilepsy	1 (0.00)
	Hemiplegia	37 (0.16)
	Facial paralysis	551 (2.49)
	Wrist drop	76 (0.34)
Skin disorders	Leprosy	6 (0.02)
	Leukoderma	428 (1.93)
	Fungal disease	181 (0.82)
	Eczema	720 (3.26)
	Allergy	22 (0.09)
	Psoriasis	278 (1.25)
	Urticarial rashes	155 (0.70)
Gynaecological disorders	Dysmenorrhoea	80 (0.36)
	Menorrhagia	65 (0.29)
	Amenorrhoea	152 (0.68)
	Leucorrhoea	707 (3.20)
	Infertility	36 (0.16)

	Tumours of the uterus	1 (0.16)
	Fibroid uterus	11 (0.04)
	Cancer of uterus	2 (0.00)
Endocrine disorders	Diabetes	1036 (4.69)
	Thyroid	4 (0.01)
	Skin diseases *(Karunkarandai)*	11 (0.05)
Paediatric diseases	Skin diseases *(Senkirandai)*	72 (0.33)
	Diarrhoea	386 (1.75)
	Worm infestation	2 (0.01)
	Fever	881 (3.99)
	Hypertension	184 (0.83)
	Blood disorders	524 (2.36)
Others	Anorectal disorders	678(3.06)
	Urogenital disorders	184(0.82)
	Surgery	27(0.12)
	Others	1949 (8.83)
OVERALL		**22069 (100)**

** - The morbidities have been grouped under broad categories in the 'Description' column and the more specific diagnostic terminology has been used in the 'Diseases' column as followed in the PHC registers. # - Some terminology may not mean the same as the corresponding term in Allopathy implies (E.g. "Primary Complex", "Dropsy" etc)*

Figure 1: Overall Top 10 Morbidities among patients attending Siddha centres

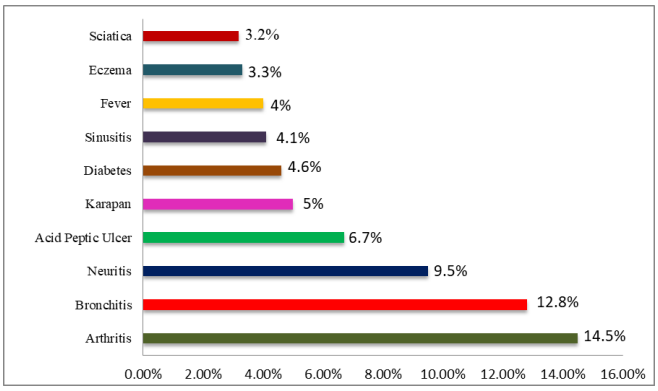

Table 3: Age-wise distribution of the study population as per Siddha system (n=22069)

Order of ranking	Diagnosis	<15	15-35	36-59	>60	Chi-square (p-value)
1	Arthritis	2 (0.3%)	82 (3.9%)	2225 (37.7%)	886 (43.7%)	3.553
2	Bronchitis	570 (81.2%)	852 (40.9%)	1123 (19%)	289 (14.2%)	(<0.01)
3	Neuritis	7(1%)	147 (7.1%)	1223 (20.7%)	730 (36%)	
4	Skin diseases *(Karapan)*	98 (14%)	394 (18.9%)	534 (9%)	78 (3.8%)	
5	Acid peptic ulcer	25 (3.6%)	608 (29.2%)	797 (13.5%)	46 (2.3%)	

Figure 1 illustrates the Top ten morbidities for which people were seeking care in siddha clinic and Arthritis was the top most morbidity for which nearly 14.9% of the people were seeking care followed by Bronchitis (12.8%) and Neuritis (9.5%).

In the Age-wise distribution of morbidities over the various age groups, it was found in age group of more than 60 years, Arthritis (43.7%) was the commonest morbidity for which people are seeking care and among children of less than 15 years, Bronchitis (81.2%) was the commonest morbidity and the distribution was found statistically significant. (Table 3)

Table 4: Type of case distribution of the study population as per Siddha system (n=22069)

Order of ranking	Diagnosis	New case	Old case	Chi-square (p-value)
1	Arthritis	1673(31.1%)	1522(28.5%)	1.65
2	Bronchitis	1154(21.5%)	1680(31.4%)	(<0.01)
3	Neuritis	1229(22.9%)	878(16.4%)	
4	Skin disease *(Karapan)*	554(10.3%)	550(10.3%)	
5	Acid peptic ulcer	764 (14.2%)	712(13.3%)	

Table 5: Gender distribution of the study population as per Siddha system (n=22069)

Order of ranking	Diagnosis	Male	Female	Transgender	Chi-square (p-value)
1	Arthritis	1477 (26.6%)	1717 (33.2%)	1 (33.3%)	1.395
2	Bronchitis	1680 (30.3%)	1153 (22.3%)	1 (33.3%)	(<0.01)
3	Neuritis	1005 (18.1%)	1101 (21.3%)	1 (33.3%)	
4	Skin disease *(Karapan)*	539 (9.7%)	565 (10.9%)	0	
5	Acid peptic ulcer	844 (15.2%)	632 (12.2%)	0	

Type of case distribution of the study population shows Arthritis (31.1%) being the commonest morbidity in New cases and Bronchitis (31.4%) being common in the Old cases and the differences were found to be statistically significant. (Table 4)There is a statistical significance between genders as evidenced by chi-square test. (Table 5)

DISCUSSION

Although morbidity profiling studies at allopathic primary care facilities are fairly common, the literature on Siddha centres is much limited. Hence, we have extended the comparison of patient profiling to those done in allopathic primary care settings also when comparable data on Siddha patients are not available.

The study by Boopathiraj et al at the National Institute of Siddha, Tambaram, Chennai showed that patients sought consultation mainly for diseases related to the field of rheumatology (33%) followed by dermatology (19.2%), respiratory system (9.1%), neurology (7.7%), gastroenterology (6.5%), ENT (6.1%) and endocrinology (4.2%). The study reported that the mean (SD) age of patients attending Siddha OPD was 39.5 (14) years and 38.3 (13) years among males and females respectively,

while the current study population had a mean age of 45.6 (18.5) years.[5]

A similar study conducted by Duraisamy et al reported that, arthritis (21%), neuritis (10%), fungal diseases (7%) were the top morbidities among the adults.[6] Another study done by Kalaiselvi et al among the elderly population attending Siddha facilities, Arthritis (45.2%), neuritis (8.8%), diabetes (6.6%), bronchial asthma (5.2%), hemiplegia (3.7%) were the top five morbidities they sought for.[7] In the present study, among the elderly (>60 years) arthritis (43.7%), neuritis (36%), bronchitis (14.2%) were the common morbidities. Kishore and Garg in their study in a rural western India reported that the commonest morbidities among elderly were cataract (30%), arthritis & arthralgia (15.6%), refractory error (13.6%), anaemia (13.3%), chronic bronchitis (7.3%), dental caries (7%), hypertension (5.2%) and impaired hearing (5%).[8]

In general, visual problems, arthritis/joint pains, respiratory problems and hearing problems were the common morbidities among majority of the studies.[9-11] Though vision and hearing problems were the commonest geriatric problems, in the present study, we did not observe a similar pattern. This might probably be because elderly patients in the study population with these 'expected' elderly health issues were seeking care in Allopathy clinics for these complaints and hence are not listed as the 'presenting complaint' in our study in AYUSH clinics.

Different findings have been reported by many studies in India and abroad in health facilities practicing allopathic system of medicine. The difference in findings across the studies may be due to the preference of patients with a particular type of illness towards a particular system of medicine, differences in methodology of diagnosis of illness and differences in operational definition / terminology of the illness.

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Usage pattern of health-related smartphone applications among the medical students - A Cross-sectional study from central Karnataka, India

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ABSTRACT

Background: The use of smart phones is widely prevalent and becoming increasingly affordable. The level of smart phone use by medical students is increasing day by day. However, studies looking at the usage of health related smart phone applications among medical students are few. Thus, our study aimed to know the usage pattern of health related smart phone applications among the medical students. **Methods:** A cross sectional study was carried out from May-July 2018 among undergraduate students in JJM Medical college, Davangere. A pretested semi-structured questionnaire was used for collecting the data. The study participants were asked about use of health related smart phone applications, their satisfaction and perceived benefits after using the health related smart phone applications. Self-reported health status of the students was also collected. Descriptive statistics was used for the analysis. **Results:** A Total of 62 participants participated in the study and were using health related apps. Majority of the participants who were using health apps were females. The most widely used application was nutrition apps which accounted to 56.4%. About 72.4% of the study participants were spending 30minutes to 01 hour using the health related apps. 19.35% of the study participants perceived the apps to be useful and minority of them were satisfied by the information provided by the health related applications. **Conclusion:** Study concludes that among the study participants' majority were females and they were using nutrition related applications. Majority of the users were not satisfied with the information provided by the health related applications.

Key Words: Smart phones, Medical students, Health related smart phone applications, Usage of apps.

INTRODUCTION

Technology has been growing in rapid pace. The advances in information and technology has led to invention of smartphones**.** The smart phones have become integral part of day to day life of individuals. A smartphone is a device in which additional features can be added by means of applications and it has an operating system which allows individuals to be connected to world wide web.[1] The data of statistics portal has predicted that the number of smart phone users worldwide will increase from 1.5 billion in 2014 to 2.5 billion in 2019. In India the smartphone users was predicted to increase to 299.24million with the worldwide smartphone users was predicted to exceed 2.5billion users.[2] According to recent statistical report of 2018 the number of apps available for android users are 2.1million apps and for IPhone users the number of apps available are 2million.[3] Approximately 51% of mobile users in India glance at their phone without being prompted by a notification which indicates that the individuals are highly dependent on smart phones for communication , for obtaining information and for other activities. The smart phones have large varied variety of applications which are software programs which enhances the functionality of the smart phones[4]. The number of health and medical related apps which are available are over 318000 according to 2018 statistics.[5] The diverse nature of the applications is more appealing to the youth. According to 2015 report about 58% of the smart phone users have downloaded the health related apps and have used it.[6] As the smart phones are affordable more youth are able to own a smart phone. 50% of the smart phone users in India are under the age group of 25.[7] The population in this group can be encouraged to participate in various health and wellness programs. Prior studies indicated that only 24% of youth owned atleast one health-related applications and 26% of them have used health related applications only once[8]. The low acceptance rates could be attributed to the diversity of the applications available online, as well as the fact that the current health applications conceptualization does not appeal to the needs of the younger generation. Smart phones are useful to medical students because they are agile, handheld, easy to use and can be used on the move. The level of smartphone usage by medical professionals seems to be increasing exponentially.[9] The studies regarding the usage of health related smartphone applications among the medical students. Therefore, this study was undertaken to know the usage of health related smartphone applications among the medical students of JJMMC.

MATERIAL AND METHODS

A cross sectional study was carried out from May-July 2018 in JJMMC. After obtaining approval from the institutional ethical committee the study was carried out. Around 450 undergraduates were approached for the study. Among them only those participants who had used any health related smart phone applications atleast once were recruited.

After taking informed consent from the participants, data was collected using pre-tested semi structured questionnaire. A total 142 medical students took part in the study. Among them those who did not complete the questionnaire were excluded from the study. So, the data of 62 students who had completed the study questionnaire was part of the study.

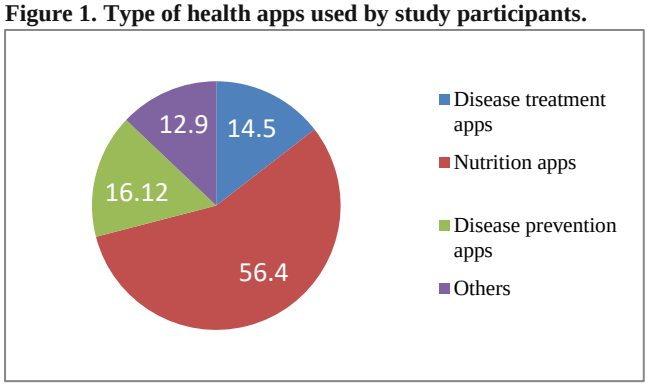
Data was collected using pretested semi-structured questionnaire. The questionnaire contained 15 questions and answering all questions were mandatory. Data was collected on the purpose of usage of health related smartphone applications among the medical students. Smart phone usage and preferences: The time spent by each student using the smartphone applications was explored and their preferences of the type of applications used by the medical students was explored. The student receptiveness and the satisfaction of the student after using the smart phone related health applications was also explored.

Data was entered in Microsoft excel and analysed using SPSS version 16. Descriptive statistics were used and data was presented in the form of text, tables and figures.

RESULTS

62 medical students were included in the study based on the inclusion criteria. Majority of the study participants were female i.e. 35 (56.4%) and males were 27 (43.5%) . Majority of the study participants were in the age group 21 i.e. 41.9% followed by 29% who were in the age group of 22 followed by 14.5% were in the age group of 20 years and 8.1% were in the age group of 23years and 6.4% were in the age group of 24years.

Figure 1. Type of health apps used by study participants.



Among the study participants' majority that is 35 (56.4%) were using nutrition apps followed by 10(16%) were using Disease prevention apps. The disease treatment apps were used by 9 (14.5%) of the students and 8 (12%) were using other apps. (Figure 1)

Table I: Attitude of the study participants regarding usage of health related apps.

Characteristic	Grade	Number of students	Percentage
Perceived benefits	Very useful	12	19.35
	Not useful	50	80.2
Satisfaction with health apps	Very satisfied	10	16.12
	Not satisfied	52	83.87

Figure 2 Time spent by study participants using health related apps

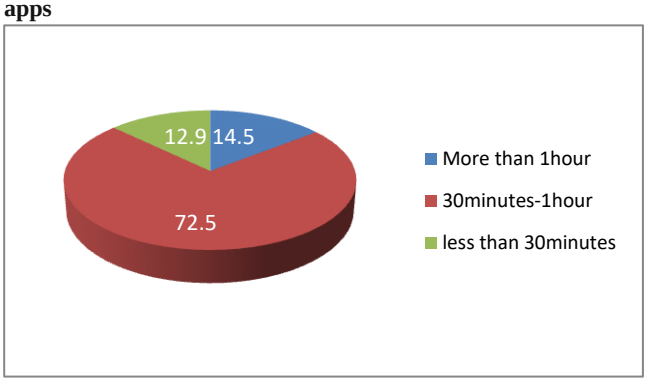


Table II: Purpose of Usage of health related apps

Purpose of usage of health apps	Number	Percent
Health issues	16	25.8
Weight management	11	17.74
No Specific purpose	35	56.45

The attitude of the medical students after the usage of the health related apps was found out. Only minority of the study participants 12(19.35%) perceived that the health was useful and 10(16.12%) of the medical students were satisfied with the information provided by the health related smartphone applications. About 50(80%) felt that the health related applications were not really useful and 83% of the medical students were not satisfied with the information provided by the health related applications. (Table I)

Among the study participants about 9(14.5%) were spending more than one hour/day in using this health related smart phone applications. About 45(72.5%) were spending 30minutes-one hour /day using the health related smartphone applications and 8 (12.9%) were spending less than 30minutes/day. (Figure 2)

Among 62 study participants 16(25.80%) study participants used health related smart phone applications as they had health issues. About 11(17.74%) used health related smart phone applications for weight management. About 35(56.45%) used health related smart phone applications without any specific purpose. Among the study participants whose purpose of usage of the apps was health issues, the

most commonly used app was nutrition apps about 8(50%) followed by disease treatment apps, disease prevention apps and other apps. (Table II)

DISCUSSION

Our present study highlights that less proportion of medical students are using smart phone related health applications with usage predominantly in nutrition related applications. On the other hand, it was found that very few study participants perceived health related smart phone applications to be useful and very few were satisfied with the information provided by the smart phone applications. The results show that health related smart phone applications are not still widely used and/or accepted by the students. About 50% of the students used health related smart phone applications in our study. In a study done in American adolescents it was found that 21% of smart phone users downloaded health related smart phone applications.[10] In a study done in Vietnamese youth it was found to be 14%[11]. Notably in our present study it was found that nutrition applications were more preferred over the disease prevention and disease treatment applications. These findings were consistent with the findings in a previous survey where weight management, fitness applications were preferred more.[12-13]In the present study it was found that minority of students perceived these health related applications to be useful. In a study done in Vietnamese youth 50% students perceived health related smart phone applications to be useful.[11] In a study done by Chan et.al it was found that half of the sample perceived the benefits of these health related smart phone applications to be useful.[14] About 50% of the students were using health related smart phone applications which implies that they have better awareness of how the health status influences their performance academically which prompted to seek health information using technology in the form of health related smartphone applications. In Literature educational status is a significant predicator of seeking health behaviour such as seeking further health related information by using technology i.e internet services.[15-18] In our present study it was found that students with health issues were more concentrating on usage of nutrition related applications rather than disease treatment and disease prevention applications. In previous studies it was found that youth and adolescents with chronic illness were more likely to use m-health apps to improve their conditions.[14] It was assumed that 50% of our study participants preferred to visit nearest health facilities whenever they are encountered with health issues rather than downloading the health related smart phone applications in their smart phones. This health related smart phone applications were used to promote better health in adolescents with bringing change in their life style through the apps.

The limitations of our study are as it a cross-sectional study, we could assess the attitudes of the students towards health related smart phone applications only at one point of time, but attitudes of the medical students towards health related smartphone applications may keep changing with time. Secondly most of the data which was gathered was a self-reported information so there may be insufficient recall from the students while answering the questionnaire. The results which are obtained in our study might not be generalised to the rest of the young population as they belong to different socioeconomic classes and different educational streams.

Conclusion: In conclusion this study highlights that 56% study participants were female and 44% were male who were using health related smart phone applications but only minority perceived these health related applications to be useful and few were satisfied with the information provided by the health related applications. As the features and uses of these health related smart phone applications expand, they will become widely used applications. Developing the health related applications in areas of disease prevention and quality of life improvement could be feasible to proliferate the benefits of these applications. Further research in the area of these m-health applications are recommended to optimise the content and interface of these apps to meet the demands of the population. Promotion of the knowledge and skills in the medical students in using the health related applications is necessary as it will help in their professional growth and competency.

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Co-occurrence of Attention Deficit Hyperactivity Disorder in children with Autism Spectrum Disorder- A Hospital Based Study

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ABSTRACT

Introduction: Autism spectrum disorder (ASD) is a Neuro-developmental disorder characterized by impaired social interaction, verbal and non-verbal communication, restricted and repetitive behaviors. The symptoms of ASD and Attention Deficit Hyperactivity Disorder(ADHD) often co-occur. The DSM-V, in its revised ADHD diagnostic criteria, recognizes the frequency of this co-occurrence and allows, for the first time, a co-morbid diagnosis of ADHD with ASD. This allows more efficient clinical management of these children. **Aim**: To describe the profile of children with ASD enrolled in the Multimodal therapy unit of a tertiary care hospital and to estimate the co-occurrence of ADHD among these children. **Methods:** This cross-sectional study was carried out among 50 children with ASD enrolled in the Multimodal therapy unit of a tertiary care hospital in Tirunelveli in 2018after obtaining informed consent from the parent. Children were classified into the 3 levels based on the support they need. The diagnosis on the co-occurrence of ADHD was made based on DSM –V criteria. **Results**: Among the children ,78% were males and 22% were females. The mean age of diagnosis of ASD was 2 years. 38% were in level 1, 46% in level 2 and 16% in level 3 based on the support they need. Co-occurrence of ASD with ADHDwas28% (10% attention deficit and 18% hyperactivity). **Conclusion**: The co-occurrence of ASD and ADHD is high. The study stresses the need for a very detailed examination for ADHD features among children with ASD for better management.

Key Words: Autism Spectrum Disorder, Attention deficit, hyperactivity, children

INTRODUCTION

Autism spectrum disorder (ASD) represents a group of neurodevelopment disorders(NDD) characterized by impairment in reciprocal social interaction and communication, along with restricted and repetitive behaviors including sensory issues(hyper/ hypo-reactivity to stimuli (lights, sounds, tastes, touch, etc.) or unusual interests in stimuli (staring at lights, spinning objects, etc.) that are both unique to the individual.(1) The severity of the problem is classified , based on the level of daily support they require into three levels by DSM –V as: Level 1: requiring support, Level 2: substantial support and Level 3: very substantial support.

It is estimated that worldwide 1 in 160 children has an ASD. This estimate represents an average figure, and reported prevalence varies substantially across studies.(2) The prevalence is estimated to be one in 100 children in India with a range between 0.6 to 3.2 in children aged 6-9 years of age.(3)ASDs begin in childhood and tend to persist into adolescence and adulthood. In most cases the conditions are apparent during the first 5 years of life withsubstantial physical and mental health problems across the lifespan(4,5) which places a large financial, social and personal burden on individuals, families and society.(6)

There are no single known causes of ASD; it is believed to be caused by a complicated interplay between genetic, epigenetic and environmental factors. (7).The factors associated with ASD risk in the meta-analysis were advanced paternal age at birth, maternal prenatal medication use, gestational diabetes, order of birth. (8) Although the estimated 60-92% concordance rate in monozygotic twins as compared to 0-10% in dizygotic twins underscores the importance of genetic influences, the incomplete concordance in monozygotic twins also indicates a role of environmental factors. (9,10).

Hyper-systemizing predisposes individuals to show talent, and review evidence that hyper-systemizing is part of the cognitive style of people with autism spectrum conditions.(11) Researchers have found that hypo-responsiveness and hyper-responsiveness co-occurred in autism spectrum disorders.(12)Nocturnal enuresis is particularly prevalent in children who have autism spectrum disorders.(13)

A few studies suggest that symptoms can be detected before the first birthday in some children.(14)Many children with ASD exhibit recognizable problems in social interactions in their first year of life.(15) Hand flapping, toe

walking, and sustained odd play were associated with a decrease in the age of diagnosis, whereas oversensitivity to pain and hearing impairment were associated with an increase.(16)

Co-occurring disorders are common in ASD and will affect daily life. Attention deficit hyperactivity disorder (ADHD) is a psychiatric disorder of neurodevelopment type. It is characterized by problems paying attention, excessive activity, or difficulty controlling behavior which is not appropriate for a person's age. ADHD includes three subtypes: primarily inattentive (e.g., distracted, poor organization and follow-through); primarily hyperactive-impulsive (e.g., fidgety, overly active, interrupts); and combined. (1)

Symptoms of attention deficit hyperactivity disorder (ADHD) and autistic spectrum disorder (ASD) often co-occur**.** The core symptoms of ADHD (attention deficit, impulsivity, and hyperactivity) are part of ASD, and ASD and ADHD have similar underlying neuropsychological deficits. Autistic symptoms are not common in ADHD. Because of the high frequency of ADHD symptoms in ASD, children with ASD may initially be misdiagnosed with ADHD.(17) Studies show that between 30 and 50% of individuals with ASD manifest ADHD symptoms (particularly at pre-school age), and similarly, estimates suggest two-thirds of individuals with ADHD show features of ASD.(18) Co-occurrence of ADHD and ASD is associated with a lower quality of life and poorer adaptive functioning than in any one of these conditions.(19) Both disorders often include difficulties in attention, communication with peers, impulsivity, and various degrees of restlessness or hyperactivity. Both are more common in boys than in girls, and present, at least partially, at pre-school age. Both disorders have a known genetic pre-disposition, with co-morbidity within the same individual and across family members, and both syndromes cause significant behavioral, academic, emotional, and adaptive problems in school, at home, and elsewhere. (20)

The DSM-V, in its revised ADHD diagnostic criteria, recognizes the frequency of this co-occurrence and allows, for the first time, a co-morbid diagnosis of ADHD with autism spectrum disorder. This will not only allow for more efficient clinical management of these children, but will also clear the way for a more precise scientific understanding of the overlap of these two disorders.(1)
ASD behaviors contribute both to difficulties these families experience raising a child with autism and to the stigma processes associated with those behaviors. Research comparing individuals with both diagnoses to individuals with a single diagnosis suggest that co-occurring symptoms are associated with greater impairment than a single diagnosis. Both parent and teacher reports children with ADHD and ASD experience more difficulty in daily life. Furthermore, these co-occurring conditions may be less responsive to standard treatments for either disorder.(21) Increasing social interaction by teaching new skills may lead to reductions in problem behavior, such as motor stereotypes. (22).To provide adequate support and intervention for the child and the family, the child's profile as well as coexisting medical disorders needs to be considered.(23). Thus, this study aims to describe the profile of children with Autism Spectrum Disorder enrolled in the Neurodevelopment clinic of a tertiary care hospital and to estimate the co-occurrence of Attention Deficit Hyperactive Disorder among these children with ASD

MATERIAL AND METHODS

This cross-sectional study was carried out at the Multimodal therapy unit attached to the Dept. of Psychiatry in a tertiary care hospital of Tirunelveli in 2018. The study was initiated after obtaining approval from the institutional ethics committee and 50 children diagnosed with Autism Spectrum Disorders according to DSM- V criteriaand enrolled in the Unit were included in the study after obtaining informed consent from the parent. Non-consenters and Children with intellectual disability, poor academics (dyslexia), conduct traits, childhood mood disorders, oppositional deficit disorders (as per diagnosis made by psychiatrist) are excluded from the study. Data on basic sociodemographic characteristics were collected. Children were classified into the 3 levels based on the support they need as - Level 1 autism (mild symptoms and may not require much support), level 2 or 3 autism have moderate and severe symptoms and require more substantial support. The diagnosis on the co-occurrence of ADHD was made based on the presence of a sufficient number of core symptoms and functional impairment as per DSM –V criteria. The data obtained were tabulated and analyzed for mean, proportion.Chi-Square test was used to calculate statistical association.

RESULTS

SOCIODEMOGRAPHIC CHARECTERISTICS:

The study included 50 children with ASD, of which 39(78%) were males' and11(22%) were females. Almost 50% of the children belonged to age group 0-5 years. (Table:1) With the exception of a set of twin, none of the siblings of other 49 children had ASD. The mean age of mothers at the time of birth of the ASD child was 27.8years. 2 mothers were >35years of age during their child birth. The mean age of fathers at the time of birth of the child with ASD was 31.5 years. There were 2 fathers above the age of 40years during the child birth. Among the mothers, one was illiterate and 20% were professionals

PROFILE OF CHILDREN WITH ASD

On the basis of need for support, it was found that that 19children were in level 1(28%males & 10% females), 23 in level 2 (38% males & 8% females) and 8 in level three (12% males & 4% females). But the higher incidence of severity among male children than female was found to be statistically insignificant (p> 0.05).The mean age of

diagnosis of ASD among these 50 children was 2 years . Only in 36% of children, ASD was diagnosed before their 2nd birthday and in 6%, it was diagnosed only after 8 years of age.(Table 2). It is found that children who had delayed diagnosis of ASD had severe form of the disorder needing more support and this association was found to be statistically significant ($p<0.05$).

Table 1: Distribution of children based on Age and Sex

Age(yrs)	No of Males	No of Females	Total
0-5	16	7	23
06-10	18	2	20
11-15	5	2	7
Total	39	11	50

Table 2: Age at diagnosis and Level of ASD($p< 0.05$)

Age at diagnosis	Level of ASD			Total
	Level 1	Level 2	Level 3	
</=2yr	13	4	1	18
3-5yr	6	16	0	22
6-8yr	0	3	4	7
>8yr	0	0	3	3
Total	19	23	8	50

Table 3: Mother's Education versus Age at Diagnosis

Mother's education	Age at the time diagnosis			
	<2yr	3-5yr	6-8 Yr	>8yr
Illiterate	0	0	0	1
Primary school	0	1	1	0
Middle school	4	5	2	0
High school	1	5	1	1
Post high school	2	1	2	1
Graduate	7	5	0	0
Professional	4	5	1	0
Total	18	22	7	3

($p< 0.05$) P=0.0347

The symptom that made the parents seek medical help was either delayed language milestones (29%) or non-response to call (16%). In 5% of the children the diagnosis had been made by chance. Among these children, repetitive behaviour that were noticed include repeating noises(32%), wheel spinning(24%), spinning objects(16%), lining of toys(8%), head banging(6%), scratching and watching moving objects (4%), and hand flapping, repeating words and snapping fingers were found in 2% each.(Fig:1) Among Sensory problems, 64% of the children showed altered sensitivity to sound. Under Motor abnormalities 22% of the ASD children manifest vestibular problems in the form of tiptoe walking. Nocturnal enuresis was reported in 14% of the ASD children. 56% of the ASD children showed special areas of interest like music (42%), drawing and swimming. (Fig: 2)

Table 4: Mother's education Versus Level of ASD

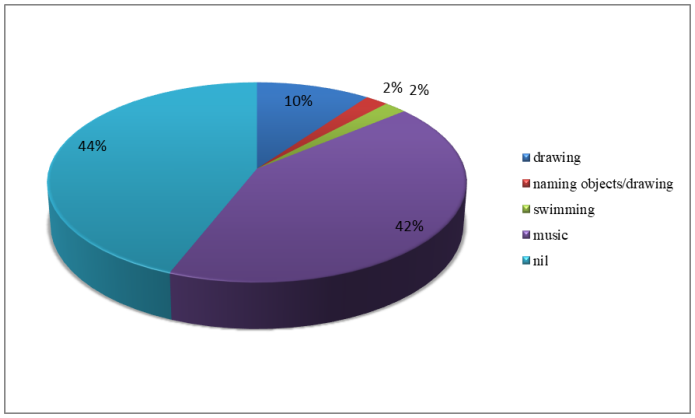
Mother's Education	LEVEL OF ASD		
	Level 1	Level 2	Level 3
Illiterate	0	2	1
Primary school	1	1	0
Middle school	2	6	3
High school	1	6	1
Post high school	2	1	3
Graduate	8	3	0
Profession	5	4	0
Total	19	23	8

($p< 0.05$) P=0.0473

Table 5: Co occurrence of ADHD and Levels of ASD

Level of ASD	ADHD present		ADHD absent	
	Males	Females	Males	Females
Level 1	2	0	12	5
Level 2	7	0	12	4
Level 3	3	2	3	0
Total	12	2	27	9

Fig 2: Special Areas of Interest



It was found that mothers with higher educational qualification had been able to identify the symptoms earlier and had better health seeking behavior and this association was found to be statistically significant ($p<0.05$). (Table:3) . The association between the level of severity of ASD and the mother's education was found to be statistically significant ($p<0.05$). (Table:4)

CO OCCURRENCE OF ADHD

The co-occurrence of Attention Deficit Hyperactivity Disorder (ADHD) was 14(28%) with 12 males and 2 females. Among the co occurred ADHD, 10% was attention deficit and 18% was hyperactivity features. The

co occurrence of ADHD was more among children in level 2 of ASD (50%) (Table:5)

DISCUSSION

This study showed an increased predisposition of ASD among males with a male-female sex ratio 3.3:1 which was similar to the study made by Mend-Chuan Lai et al which had a male-female sex ratio of 4-5:1 (24) and it was 3.67: 1 in the study by Kondekar A et al.(25). In this study , the average age of diagnosis was 2 years when compared to the study by David S.Mandell, where the average age of diagnosis was 3.1 years for children with autistic disorder and it was 19 months in the study by De Giacoma et al(26). Children with severe language deficits received a diagnosis on an average of 1.2 years earlier than other children (16).

In this study, the symptom that directed to the diagnosis of ASD was either delayed language milestones(29%) or non-response to call(16%). In the study by De Giacoma et al, the most common initial symptom recognized by parents was delayed speech development in 54.4% (26). Language delay was the commonest developmental concern in 83.03% in the study by Kondekar A et al (25)).Also Stereotypical movements, rocking, spinning, hand flapping movements were observed as common motor mannerism in almost 50% of study group. In this study repetitive behaviour noticed, include repeating noises(32%), wheel spinning(24%), spinning objects(16%), lining of toys(8%), head banging(6%), scratching and watching moving objects (4%), and hand flapping, repeating words and snapping fingers (2%) each. Nocturnal enuresis is reported in 14% of the ASD children in this study. In a study done by Von Gontard et al, children with ASD showed increased rates(30%) of nocturnal enuresis compared to controls(27)

In this study, 28% of the ASD children had co occurrence of.Co-morbidity between ASD and ADHD has been reported in 78% in the study by Lee Do et al (29) and 53% by Sinzig et al (30)

CONCLUSION:

The co-occurrence of ASD and ADHD is high and worsens the quality of life of autistic children. The study stresses the need for a very detailed examination for ADHD features, the type of predominant ADHD, sub-symptomatology among children with ASD to achieve better first-line treatments. The period between initial recognition of symptoms and immediate approach for health care is important in ASD and ADHD, because it allows immediate behavior-based and therapeutic intervention. Increased awareness for early recognition of symptoms among parents and Parent training may be initiated on how to manage these children becomes essential. Thus a holistic intervention will promote betterment in the quality of living among these children.

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Awareness on Health Insurance among a selected Urban Population in Puducherry

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ABSTRACT

Background: Every year, OOP spending pushes 3.5% to 6.2% of the India's population below poverty line. So there is a need to determine whether this is due to lack of awareness on part of the public. **Objectives:** To assess the awareness about health insurance among a selected urban population of Puducherry and to explore the individual preferences regarding health insurance and their utilization pattern. **Methodology:** A Cross Sectional Study was conducted in urban field practicing area of institution. The houses were chosen by Systemic Random Sampling technique. The sample size was 234. The study was carried out for a period of 3 months. A semi-structured, pretested questionnaire was used as data collection tool. **Results:** The mean age of the participants was 43.9 ± 13.87 years with majority being in the age group of 20 - 40 years (50.4%). About53.8% were aware about the health insurance whereas their willingness to obtain Health insurance accounts only for 28.6%. There was a significant association ($p<0.05$) between the level of education, family type and awareness of the participants and between willingness and socio economic status. 95.5% of the participants have a desire to enrol in government schemes. Nearly half of them (56.7%) wanted to pay yearly. 41.8% of the participants are willing to purchase individual health insurance policy. **Conclusion:** Even though half of the respondents are aware of health insurance, they are not utilizing the same. Media seemed to have played an important role in dissemination of information. There was a significant association between type of Family, Educational status and awareness about Health Insurance. Also, the expense spend by participants who are having HI is also significantly less than the participant without HI. Hence there is need to launch information, education and communication activities in order to make aware of various Government and Private HI schemes.

Key Words: Health Insurance, Out Of Pocket Expenditure, Universal Health Coverage

INTRODUCTION

Health is a fundamental human right while wealth is an important constituent of human resource development. Good health increases human efficiency and wealth of society, decreases expenditure on sickness and diseases (1). Despite a significant demand for community-based health services, National spending on healthcare is only 1.2 per cent of total Gross Domestic Product (GDP) (2). Hence, even the poorest and least educated people in both rural and urban settings are forced to consult private practitioners more than government practitioners spending more than three-quarters of their spending as Out-Of-Pocket (OOP) expenses. The term Catastrophic Healthcare Expenditure (CHE) occurs when OOP expenses for healthcare services takes up such a large amount of the household's income which makes them potentially face poverty. It can be defined as either more than 10% of total monthly consumption expenditure or more than 40% of the nonfood consumption expenditure (3). A person who has insured can walk into a health facility without fear of financial burden. Health Insurance (HI) protects most of the low to middle income citizens from the burden of emergency healthcare expenses thereby alleviating their financial pressure. (4).

'Universal Health Coverage for all by 2030' agenda has the goal of "ensuring everyone within a country can access the health services they need in a sufficient quality to be effective and providing all with financial protection from the costs of using health services"(5). This goal would be reached by implementing universal health insurance, a potential way of reducing health disparities and OOP health expenditure. In the last 8 years, a large amount of government's money has been invested in the implementation of health insurance schemes. But the existing health insurance coverage is insufficient in achieving universal health coverage (6). The recent National Sample Survey (NSS) report reveals that 82% of urban and 85.9% of rural population have no access to any kind of health protection coverage which made them either to borrow or sell their assets (6) Also the awareness about existing Health Insurance Schemes is not satisfactory (7).

Hence, this study aimed to assess the awareness about health insurance among urban population of Puducherry and to explore the individual preferences regarding health insurance and their utilization pattern.

METHODOLOGY

This Cross Sectional Study was conducted at a village under the urban field practicing area of the institution after obtaining the clearance from the Scientific Research and Ethical Committees of institution. The sample size was estimated to be 234 with prevalence calculated from the previous study (8). The houses were chosen by Systemic Random Sampling method. Every 4th house was selected and if the house was vacant, immediate next house was taken for interview. Study Participants were Household head or their spouse or senior household (in their absence) who were aware of information aged above 21 years and who was willing to participate in the study were included in the study. The study was carried out for a period of 3 months. A semi-structured, pretested questionnaire consisting of demographic variables, knowledge and awareness regarding Health Insurances was used as data collection tool. The interviewer sensitized the family members in their respective houses about this study and their written consent was obtained. Confidentiality was assured. The data collected was entered in Excel and was analyzed using SPSS version 21. Mean, Standard Deviation and Proportions was calculated. Association was seen between socio-demographic characteristics and Awareness about Health Insurance. p value < 0.05 was considered as statistically significant.

RESULTS

Totally 234 participants were interviewed. Most of them were in the age group of 20-40 years of age (50.4%). Only 12 % of respondents were above 60 years of age. Females constituted about 65 %. Half of the respondents were Muslims (50.8 %). Majority of the respondents (76.1%) stayed in nuclear family. About 24 % of the respondents were graduates and none of them were illiterates. According to Modified Kuppuswamy's classification of socio-economic status, 77% of the participants belonged to Class I SES**,** 12 % belonged Class II SES, 4 % belonged to Class III SES, 4 % to Class IV and 3% belonged to Class V . (Table 1)

About 126 (53.8%) respondents were aware of health insurance. Out of them, only 41 are having health insurance coverage. Among them, 31 reported that they are benefited from their scheme. Among those who were not having any Health Insurance scheme (82.5%) after the sensitization, only 33.7% are willing to purchase HI but 66.3% of the participants were not willing to obtain the same. The reasons for non-willingness as reported by them were too expensive plans, hard to understand the policies and no trust in insurance companies. [Figure 1 (a,b)].

Table 1: Socio-demographic characteristic of respondents (n=234)

Characteristic of the respondents	Numbers (n)	Percentage (%)
Age (years)		
20-40	118	50.4
40-60	86	36.8
>60	30	12.8
Gender		
Male	82	35
Female	152	65
Religion		
Hindu	107	45.7
Christian	8	3.4
Muslim	119	50.8
Type of family		
Nuclear	178	76.1
Joint	46	19.6
Extended	10	4.3
Education		
Primary	41	18
Secondary	48	20
High School	60	26
Higher secondary	28	12
Graduate	57	24
SES		
Upper	181	77
Upper middle	27	12
Lower middle	10	4
Upper lower	9	4
Lower	7	3
Marital status		
Single	3	1.3
Married	230	98.3
Widow	1	0.4

Figure 1 (b): Reason for not having HI among Participants

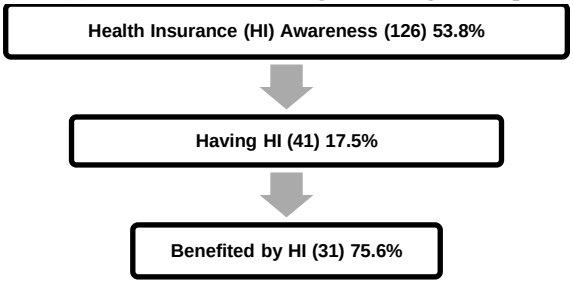

Figure 1 (b): Reason for not having HI among Participants

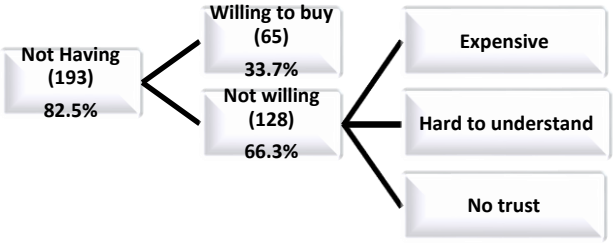

Table 2: Association between socio-demographic characteristics and awareness about HI

Characteristics	Aware n=126(%)	Not Aware n = 108(%)	Chi-square (df)	p value
Age (years)				
20-40	63 (50)	54 (50)	2.6683 (2)	0.2634
40-60	43 (34.1)	44 (40.8)		
>60	20 (15.9)	10 (9.25)		
Gender				
Male	78 (62)	74 (68.5)	1.1175 (1)	0.2905
Female	48 (38)	34 (31.5)		
Type of family				
Nuclear	102 (81)	76 (70.3)	7.1861 (2)*	0.0275
Joint	17 (13.5)	29 (26.9)		
Extended	7 (5.5)	3 (2.8)		
Education				
Primary	15 (11.9)	26 (24.1)	12.67 (4)	0.01
Secondary	29 (23)	19 (17.6)		
High School	30 (23.8)	30 (27.8)		
Higher secondary	13 (10.3)	16 (14.8)		
Graduate	39 (31)	17 (15.7)		
SES				
Upper	96 (76)	85 (78.7)	0.7646 (4)*	0.9431
Upper middle	15 (12)	12 (11.1)		
Lower middle	5 (4)	5 (4.6)		
Upper lower	6 (5)	3 (2.8)		
Lower	4 (3)	3 (2.8)		

** Fisher's test applied.*

Table 3: Association between Socio-demographic characteristics and Willingness on HI

Characteristics	Willing n = 65 (%)	Not Willing n = 128(%)	Chi-square	p – value
Age (years)				
20-40	31(47.7)	63(49.2)	1.1595 (2)	0.56
40-60	24(36.9)	52(40.6)		
>60	10(15.4)	13(10.2)		
Gender				
Male	47(72.3)	84(65.6)	0.8829 (1)	0.3474
Female	18(27.7)	44(34.4)		
Type of family				
Nuclear	52(80)	93(72.7)	4.5595(2)*	0.1023
Joint	9(13.8)	32(25)		
Extended	4(6.2)	3(2.3)		
Education				
Primary	10(15.4)	27(21.1)	6.735 (4)*	0.1505
Secondary	15(23.1)	26(20.3)		
High School	18(27.7)	34(26.6)		
Higher secondary	4(6.2)	20(15.6)		
Graduate	8(27.7)	21(16.4)		
SES				
Upper	45(69.23)	104 (81.3)	5.3059 (4)*	0.257
Upper middle	11(16.92)	11 (8.6)		
Lower middle	5 (7.69)	5 (3.9)		
Upper lower	1 (1.5)	4 (3.1)		
Lower	3 (4.6)	4 (3.1)		

Table 4: Comparison of monthly Out Of Pocket (OOP) health expenditure with or without HI

OOP health expenditure (Rupees) per month	WITH HI n = 41 n (%)	WITHOUT HI n = 193 n (%)	Chi-square	p – value
Up to 500	16 (39)	56 (29)	25.2952* (3)	0
501-1000	19 (46.3)	33 (17.1)		
1001-2000	4 (9.8)	58 (30)		
Above 2000	2 (4.9)	46 (23.9)		

Association between socio-demographic characteristics and awareness about HI reveals that there is a significant association between educational qualification and awareness about HI ($p < 0.05$). Graduates were more aware about HI than others. Also, participants residing in nuclear family were more aware when compared to those living in Joint family which is statistically significant. (Table 2)

Association between socio demographic characteristics of the participants and willingness to obtain health insurance shows that willingness was more among participants between 20 – 40 years of age group. Males were more willing compared to females because most of the women are housewives. But there was no significant association between any of the socio demographic characteristics of the participants and willingness to obtain health insurance.

Association of the amount of money spent as out of pocket expenditure on health between the participants who are having Health Insurance (HI) and without Health Insurance shows that there was a statistically significant reduction in the expenses among participants who are having Health Insurance. (Table 4) Among the participants who are willing to obtain health insurance, 95.5% of the participants have a desire to enroll in government schemes. Regarding the choice of payment of premium, nearly half of them (56.7%) wanted to pay yearly, 20.9 % preferred to pay the premium half yearly. 41.8% of the participants are willing to purchase individual health insurance policy. Among those who had HI currently, 61% of the participants with HI reported that claiming their insurance was somewhat easy. 29% were neutral with their opinion and 5% of them were replied it to be extremely easy.

DISCUSSION

The mean age of the study participants were 44 years which is more than the participants in the study done by Bawa et al (9). In the present study the majority of the respondents were female (65%). This may be due to the timing of interview done i.e day time where most of the men had gone out for work. The study conducted by Sudir et al (10) had also reported similar result (female 69.4%) due to the same reason. Our study showed that 53.8% of the participants were aware about health insurance which was not satisfactory. This was lesser than the study done by Indumathi K.et.al (11) with 75.4% awareness but better than the study done by Thakur et al and Ramegowda et al (12, 13) which showed the awareness were 29.7% and 10.5% respectively. In our study 65% of the females are much more aware about HI compared to males whereas it

is vice versa in the study conducted by Bansal et al (14) where 51.3% of the male respondents and 32.4% of the female respondents were aware of health insurance. This also may be due to the predominant female participants as discussed earlier. Regarding the source of information, major sources were television and newspapers which is similar to the study by Choudhary et al (15). The study conducted by Yellaiah (16) shown that there was less awareness about health insurance among the respondents who are less educated (primary 2%). As the education qualification increases (graduates 16 % and post-graduates 6.5 %), it is clearly seen that the awareness among the respondents is being increased. In the present study also the graduates are more aware about (31%) HI compared to others. There is also a significant difference between educational status and awareness of the health insurance. In the present study, 85.4% of them perceive that HI is mainly to recover from future health expenses. The study conducted by Reshmi et al (17) had also reported that the purpose and benefit of health insurance as perceived by the respondents were not only cover their medical expenses but also useful for Tax benefits. Very few participants (17.5%) are being covered by some form of health insurance in this study and large portion of the population is still financing health care expenditure out of pocket. Among those who had HI 75.6% were benefitted from their present schemes. Among the rest, 33.7% were willing to purchase the schemes, while others think that it is an additional burden for their family as there is not an assured return of the premium they pay in cases of non-availing of Insurance.

Conclusion:

This study shows that even though half of the respondents are aware of health insurance, they are not utilizing the same. Media seemed to have played an important role in dissemination of information. There was a significant association between type of Family, Educational status and awareness about Health Insurance. Also, the expense spend by participants who are having HI is also significantly less than the participant without HI. Hence there is need to launch information, education and communication activities in order to make aware of various Government and Private HI schemes and the need of health insurance schemes to meet the ever rising medical expenses in view of unpredictable illness and injuries. Also health insurance companies should develop a better health insurance scheme that is accessible, available, affordable and acceptable to all sections of the society.

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

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A comparative study to assess the unmet need for family planning and its determinants among married women in rural and urban community

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ABSTRACT

Background: Unconstrained population growth is mainly due to the unmet need for family planning. The major tools for improving the health of the population are increasing awareness on the use of contraceptives and implementation of effective family planning services **Aim and Objectives:** To Compare and identify the determinants of unmet need for family planning among married women in rural and urban community **Methods:** 1200 married women in the age group of 15-49 years were selected from the all seven talukas of Gulbarga from which 600 study participants who were selected randomly from wards in urban areas and 600 study participants from the villages in rural areas by using multistage sampling techniques. Collected data was tabulated and analyzed by using SPSS software **Results:** The prevalence of unmet need for family planning of married women is statistically associated with area of residence (Chi-square=4.1100 $p<0.05$) at 5% level of significance. There is significant association between need for family planning of married women with age groups, religion, Educational qualification, number of living children, income group, status of still birth, knowledge about family planning method and ideal age for marriage are found to be statistically significant **Conclusion:** The unmet need for family planning is maximum in rural and urban married women among illiterates (54.27%) and (53.33%), minimum in graduates and higher degree. Women literacy rate contributes significantly in decreasing the unmet need. Unmet need for family planning is maximum in rural and urban married women among Muslim religion (45.74%) and (41.46%), minimum in other religions. We also found that age, the number of children, ideal age for marriage and being highly supportive of family planning were found to be important indicators of current contraceptive.

Key Words: Unmet need, met need, Family planning, population, community, married women (MW)

INTRODUCTION

Unmet need for family planning related to the women who are sexually active and don't want child but not using any method of contraception, they are considered to have an unmet need for contraception [1]. Unmet need is a powerful concept for designing family planning programmes and has important implications for future population growth. Unmet need for contraception varies substantially according to the demographic and social characteristics of women. The unmet need for contraception by judicious use of resources. Substantial progress has been made in improving access to family planning globally and in India too.

There is a need for controlling the population growth through control of conception rather than prevention of conception. So as to help couples to decide freely and responsibly the number and spacing of their children [2]. India is considered to be in the third stage of demographic transition that is late expanding stage where though birth rate has decreased over the few years but still it is more than death rate. Unintended fertility fuels a rate of population growth that is out pacing the country's efforts to meet the social needs of its citizens and achieve national developmental goals [3].

In developing countries as a whole, excluding China, about 20 per cent of married women of reproductive age have Unmet need for family planning. In total more than 100 million sexually active women in developing countries would like to adopt some measures of family planning [4]. Worldwide about 40 to 60 million abortions are estimated to be performed annually, out of it half are performed illegally and many are unsafe, putting the life of pregnant women is at risk. This is one of the indicators of high rate of unmet need for family planning [5]. Even though prevalence of Unmet need for family planning is decreasing in many countries but due to increase in population the absolute number of women with Unmet need is also increasing [6].

METHODS

The study was conducted in the year 2012 to 2017 after approval from the doctoral committee of Gulbarga University, Kalaburagi. The pre-tested questionnaire was

used, the purpose of the study was fully explained to the participants and data was collected after the participant's consents. 1200 married women in the age group of 15-49 years were selected randomly from all the seven talukas of Kalaburagi district. Out of this 600 urban study participants were selected randomly from the urban wards out of 55 wards after applying multistage sampling technique. Similarly in rural areas, randomly villages are selected and 600 study participants were selected by multistage sampling procedure. The inclusion criteria were women in the reproductive age group of 15-49 years who were currently married, who were not using any method of contraception, but who either did not want any more children or wanted to wait for two or more-years-before having another child. Exclusion criteria were currently pregnant married women and unmarried women, separated/divorced women, widows, were excluded from both urban and rural community.

RESULTS

The unmet need for family planning among MW in rural community is 40.33% and 34.67% in urban community. The unmet need for family planning among rural MW is higher as compared to unmet need for family planning of among urban MW. The prevalence of unmet need for family planning of MW is statistically associated with area of residence (Chi-square=4.1100 p<0.05) at 5% level of significance [Table 3.1].

The unmet need for family planning of rural MW in the age group of 15-20yrs (50.98%) and minimum among 21-30yrs of age (34.33%) followed by other age groups. There is significant association between need for family planning of MW and age groups (Chi-square=10.2270, p<0.05). Urban MW in the age group of 41-49yrs (49.32%) and minimum among 21-30yrs of age (25.30%), followed by other age groups. There is significant association between need for family planning of MW and age groups (Chi-square=28.5010, p<0.05).Unmet need for family planning is maximum among rural married women belonging to Muslim religion (45.74%) and minimum in married women belonging to Christian religion. There is significant association between need for family planning of married women and religions (Chi-square=8.8920, p<0.05).Unmet need for family planning is maximum among urban married women belonging to Muslim religion (41.46%) and minimum among married women belonging to other religions (20.59%). There is significant association between need for family planning of married women and religions (Chi-square=8.4570, p<0.05).The unmet need for family planning is maximum among rural MW who are illiterates (54.27%) and minimum in graduates and higher degree (14.29%) followed by other educational qualifications. There is significant association between need for family planning of MW and educational qualifications (Chi-square=56.0020, p<0.05) at 5% level of significance. Among urban the unmet need for family planning is maximum who are illiterates (53.33%) and minimum in with graduation and higher degree. There is significant association between need for family planning of MW and educational qualifications (Chi-square=136.0010, p<0.05).In rural MW the unmet need is maximum with 1-2 children (41.18%) and minimum in with more than 5 children (41.18%) followed by rural MW with 3 to 5 children. There is no significant association between need for family planning of MW and the number of living children (Chi-square=0.0370, p>0.05). The Unmet need is maximum in urban MW with more than 5 children (45.99%) and minimum in urban MW with 1 to 2 children (27.78%) followed by urban MW with 3 to 5 children. There is significant association between need for family planning of MW and the number of living children (Chi-square=10.2580, p<0.05).Unmet need for family planning is maximum in rural MW living in nuclear family (41.05%).There is no significant association between need for family planning of rural MW and types of family (Chi-square=0.9980, p>0.05).Unmet need for family planning is maximum in urban MW living in nuclear family (34.98%).There is no significant association between need for family planning of urban MW and types of family (Chi-square=0.2660, p>0.05).Unmet need for family planning is minimum among rural MW whose opinion about ideal age of the women to become pregnant is 20+yrs (41.13%) as compared to unmet need for family planning in rural MW who felt that the ideal age of the women to become pregnant is 15-20yrs (62.98%). There is no significant association between need for family planning of rural MW and opinion of ideal age of the women to become pregnant (Chi-square=0.2930, p>0.05).Unmet need for family planning is maximum among urban MW whose opinion about ideal age of the women to become pregnant is 20+yrs (40.78%) as compared to unmet need for family planning in urban MW who felt that the ideal age of the women to become pregnant is 15-20yrs (32.07%). There is significant association between need for family planning of urban MW and opinion of ideal age of the women to become pregnant (Chi-square=4.2120, p<0.05).

In rural unmet is maximum in rural MW with 4+ living children (59.38%) and minimum in rural MW with 1-2 living children (33.68%, followed by rural MW with 3-4 living children. There is significant association between need for family planning of MW and number of living children (Chi-square=13.7060, p<0.05).The unmet need for family planning is maximum in urban MW with 4+ living children (54.55%) and minimum in urban MW with 1-2 living children (27.15%) followed by urban MW with 3-4 living children. There is significant association between need for family planning of MW and number of living children (Chi-square=21.2020, p<0.05).The unmet need for family planning is minimum in rural MW have no experience of abortion (39.88%) as compared to maximum in rural MW have experience of abortion (42.86%). There is no significant association between need for family planning of MW and status of abortion (Chi-square=0.2840, p>0.05).The unmet need for family planning is minimum in urban MW have experience of abortion (22.03%) as compared to maximum in urban MW

have experience of abortion (36.04%). There is significant association between need for family planning of MW and status of abortion (Chi-square=4.6110, p<0.05).The unmet need for family planning is minimum in rural MW with experience of still birth (33.33%) as compared to maximum in rural MW with no experience of still birth (40.40%). There is no significant association between need for family planning of MW and status of still births (Chi-square=0.1230, p>0.05). In urban maximum MW with experience of still birth (57.14%) as compared to minimum in no experience of still birth (34.40%). There is significant association between need for family planning of MW and status of still births (Chi-square=1.5800, p<0.05).

The unmet need for family planning is minimum in rural MW have no experience of infant deaths (40.33%) as compared to maximum women have experience of infant deaths (40.35%). There is no significant association between need for family planning of MW and status of infant deaths (Chi-square=0.0001, p>0.05). The unmet need for family planning is minimum in urban MW have experience of infant deaths (31.43%) as compared to maximum women have experience of infant deaths (34.87%). There is no significant association between need for family planning of MW and status of infant deaths (Chi-square=0.1720, p>0.05).In rural maximum MW with experience of physical deformity (66.67%) as compared to minimum in rural MW with no experience of physical deformity (39.93%). There is no significant association between need for family planning of MW and status of physical deformity baby (Chi-square=2.6330, p>0.05). In urban maximum MW with experience of physical deformity (66.67%) as compared to minimum in with experience of physical deformity (34.34%). There is no significant association between need for family planning of MW and status of physical deformity baby (Chi-square= 2.7400, p>0.05).The prevalence of unmet need for family planning is maximum in rural MW with no knowledge of family planning is (47.48%) as compared to minimum in rural MW with knowledge about family planning (38.18%). There is significant association between need for family planning of MW and knowledge about family planning methods (Chi-square=3.8420, p<0.05). The unmet need for family planning is maximum in urban MW with no knowledge of family planning is (54.96%) as compared to minimum in urban MW with knowledge of family planning (29.00%). There is significant association between need for family planning of MW and knowledge about family planning methods (Chi-square=30.4780, p<0.05).

Unmet need for family planning is maximum among rural MW whose opinion about the ideal age of the women for marriage is 18+yrs (43.41%) as compared to unmet need for family planning in rural MW who felt that the ideal age of the women for marriage is 15-18yrs (38.73%). There is no significant association between need for family planning of rural MW and opinion of ideal age of the women for marriage (Chi-square=1.2290, p>0.05).Unmet need for family planning is maximum among urban MW whose opinion about the ideal age of the women for marriage is 18+yrs (46.95%) as compared to unmet need for family planning in urban MW who felt that the ideal age of the women for marriage is 15-18yrs (30.05%). There is significant association between need for family planning of urban MW and opinion of ideal age of the women for marriage (Chi-square=15.0380, p<0.05) [Table 3.2].

DISCUSSION

In this paper, we made an attempt to describe the various determinants of unmet need for family planning in married women in rural and urban population. The study revealed that unmet need for family planning among MW in rural population is 40.33% and 34.67% in urban population. The unmet need for family planning among rural MW is higher as compared to unmet need for family planning of among urban MW. Similar study done by A. Kasthuri et al.[7] rural areas have higher unmet need (14.1%) when compared to their urban counterparts (9.7%).

Unmet need for family planning is maximum among rural married women belonging to Muslim religion (45.74%) and minimum in MW belonging to other religions. In urban MW belonging to muslim religion (41.46%) and minimum among other religions (20.59%). Religion was also observed to be a factor leading to having a higher unmet need for family planning as was found in other studies in India and Ethiopia [8, 9 and 10].

In rural MW with 4+ living children (59.38%) and minimum in rural MW with 1-2 living children 33.68%, followed by rural MW with 3-4 living children. The unmet need for family planning is maximum in urban MW with 4+ living children (54.55%) and minimum in urban MW with 1-2 living children (27.15%) followed by urban MW with 3-4 living children. A study conducted in Uttarpradesh by Rabiul Ansary et al. [11]. Revealed that there was positive relationship between number of living children and level of Unmet need i.e., number of living children increases the level of Unmet need also increases.

There is significant association between need for family planning of married women with age groups, Educational qualification, number of living children, income group, status of still birth, knowledge about family planning method and ideal age for marriage are found to be statistically significant. From the other studies they were also found that, literacy, age, the number of children, and being highly supportive of family planning were found to be important indicators of current contraceptive [12,13 and14].

Conclusion:

In our study we found that, Unmet need for family planning is maximum among rural and urban married women who belonging to Muslim religion (45.74%) and (41.46%) and minimum who belonging to other religions. There is significant association between need for family planning of married women and religions. Our study also found that, in rural and urban MW the unmet is maximum in illiterates (54.27%) and (53.33%), minimum in graduates and higher degree. There is significant association between need for family planning of MW and educational qualifications. We also found that

age, the number of children, ideal age for marriage, knowledge of family planning methods being highly supportive of family planning were found to be important indicators of current contraceptive. The proper measure should be taken to increase the literacy rate in both the community. Increasing literacy rate will help to reduce the unmet need and also to create awareness in the various religions about family planning methods with the help of their religious leaders to reducing the unmet need for contraception.

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Utilization of antenatal services under Pradhan Mantri Surakshit Matritva Abhiyan in rural area of North Karnataka: a cross-sectional study

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ABSTRACT

Background: PMSMA was launched by the Ministry of Health and Family Welfare, Government of India to improve the quality and coverage of antenatal care as part of RMNCH+A to reduce MMR. It is an initiative to help pregnant women especially from backward classes, rural areas and belonging to the unprivileged group, in remaining healthy throughout their pregnancy. **Objective**: 1. To assess the utilization of antenatal care services at PMSMA clinic on 9th of each month. 2. To know factors associated with the utilization of services in PMSMA clinic. **Methods:** A cross-sectional study was carried out in February-April 2018 among 161 mothers who had delivered within one year from the date of the study and who had registered and availed ANC services at Rural field practice area of BIMS, Belagavi. Mothers were selected using systematic sampling. After obtaining an informed, written consent from the eligible participants, data was collected regarding utilization of ANC services and the quality of care received by them. The collected data was compiled, tabulated and analyzed in MS Excel and SPSS. The results are presented as percentage and proportion and chi-square test has been applied. **Results:** Majority of participants belonged to the age group 20-30 years. Majority were Hindu by religion and belonged to low socio-economic class. ANC services under PMSMA were utilized by 32% participants. The utilization of services under PMSMA was found to be significantly associated with the type of family of the participant and awareness regarding the same. **Conclusion:** This study found low level of utilization of antenatal services under PMSMA in rural area of Belagavi.

Key Words: Utilization, Antenatal services, PMSMA, Rural Belagavi, Quality care

INTRODUCTION

Maternal health refers to health of the women during pregnancy, child birth and postpartum period. While motherhood is often a positive fulfilling experience, but for too many women it is associated with suffering, ill-health and even death. The WHO estimates that every day, about 830 women die due to the complications during pregnancy and child birth.[1] Maternal Mortality Ratio in India is 130 per 100,000 live births (2014-16), and that of Karnataka is 108 per 100,000 live births (2014-16).[2]

To reduce MMR substantially and move towards elimination of preventable cause of maternal death, increased coverage should be accompanied by improved quality throughout the continuum of care. To make pregnancy safe has remained the key objective of reproductive and child health program in India. The National Rural Health Mission (NRHM) reiterates the government's commitment to the safe motherhood. The popularity of antenatal care services in the rural community has been encouraging.[3]

With the implementation of Janani Suraksha Yojana and Janani Shishu Suraksha Karyakaram, within a short span of time significant progress was observed in the maternal health care service indicators like institutional deliveries and antenatal care coverage. As per latest data of the Rapid Survey on Children (2013-14), the institutional deliveries in India are 78.7%. Till date only 61.8% women receive first ANC in first trimester (RSOC) and the coverage of full ANC is as low as 19.7% (RSOC).[4]

As per data from NFHS-4 (2015-16), 67.3% women had antenatal check-up in first trimester while 70.9% women had at least 4 antenatal care visits in rural Karnataka. Whereas in rural Belgaum, 78.6% women had antenatal check-up in first trimester and 76% women had at least 4 antenatal care visits.[5]

MMR still remains high even with improved access to maternal health care services.[5] High MMR reflects poor coverage of antenatal care services, poor quality of care and inequity to access to health services.

The World Health Organization envisions a world where every pregnant woman and newborn receives quality care throughout the pregnancy, childbirth and the postnatal period. There is a comprehensive WHO guideline on routine ANC for pregnant women and adolescent girls on the management of specific pregnancy related complications.[6]

The Pradhan Mantri Surakshit Matritva Abhiyan was launched by the ministry of health & family welfare, government of India on 9th June 2016. The program envisages to improve the quality and coverage of Antenatal Care, Diagnostics and Counselling services and also detection, referral and follow up of high-risk pregnancy as part of the Reproductive Maternal Neonatal Child and Adolescent Health (RMNCH+A) Strategy. It is ensured that not only all pregnant women complete their scheduled ANC visits but also undertake all essential investigation. The services provided in PMSMA are detailed history taking and clinical examination followed by blood and urine investigations and ultrasonography and treatment. Special care is given to the high-risk cases. The program also includes provision of counseling services to the beneficiaries on nutrition and anemia, birth preparedness, lactation and family planning .[4]

If each and every pregnant woman in India is examined by a Medical officer/ specialist and investigated appropriately at least once during the PMSMA, the program can play a crucial role in reducing the number of maternal deaths in our country.[7]

Till now no study has been conducted to assess the quality of care given to pregnant women in rural area of Belagavi. Hence this study was undertaken with the following objectives: 1. To assess the utilization of antenatal care services at PMSMA clinic on 9th of each month. 2. To know the factors associated with the utilization of services in PMSMA clinic.

MATERIAL AND METHODS

The present cross-sectional study was carried out in months of February – April 2018, among mothers who had delivered within one year from the date of the study and who had registered and availed ANC services at a rural field practice area of Department of Community Medicine, BIMS, Belagavi.

Sample size was estimated by considering the findings by Manju Rani et al on clinical components of quality antenatal care in south India, the average prevalence of which comes as 88%.[8] By taking absolute error of 5% the sample size was calculated to be 161.

Primary Health Centre in the rural field practice area of BIMS caters to a population of 43,000 and has 6 subcentres. The study population was selected in proportionate to the number of total deliveries in each subcentre in the last 1 year. A list of mothers who delivered within last 1 year of the commencement of the study was collected from each subcentre and individual subjects were selected using systematic sampling with sampling interval being 5. In case the selected participant was not available, the next participant was selected for interview. Women not willing to participate in the study and women with psychiatric illness were excluded from the study.

After obtaining an informed written consent from the eligible participant, she was interviewed at her residence or nearest anganwadi centre using a predesigned and pretested questionnaire to get information on her socio demographic profile, quality of care given to her, utilization of antenatal services in PMSMA clinic and awareness of this program launched by the Government. Mother child protection card which is available from the respondent was checked to confirm the service utilization and the investigations carried out. The data was cross checked from the ANMs registers and registers of PHC.

The collected data was compiled and tabulated in MS Excel and analysis was done in SPSS 20.0. The results have been presented as frequency, percentage, proportion and chi-square test has been applied.

RESULTS

A total of 161 mothers were surveyed during the study period. Majority of them i.e. 117 (72.7%) were between 16-25 years. The remaining 44 (27.3%) participants belonged to 26-35 years age group. The majority of the participants, i.e. 153 (95%) were Hindus by religion. 72 (13.6%) participants were SC/ST, 41 (25.5%) were OBC and the remaining 98 (60.9%) belonged to other caste groups. 3.1% of the participants were illiterate while 94.4% of the participants had received education beyond primary school. Out of 161 mothers, 152 (94.4%) were housewives while remaining 9 (5.6%) were employed. 38 (23.6%) belonged to nuclear family while remaining 123 (76.4%) belonged to joint/3 generation family. Socio economic status classification showed that 5 (3.1%) belonged to class I, 26 (16.1%) belonged to class II, 34 (21.1%) belonged to class III, 62 (38.5%) belonged to class IV and 34 (21.1%) belonged to class V socio-economic status according to modified B.G.Prasad classification. Out of 161, 116 (72%) mothers were BPL card holders (Table 1).

Among the study participants, only 32% (52) claimed to have utilized antenatal care in PMSMA clinic which is held on 9th of every month. The remaining 68% (109) of the participants utilized the routine antenatal care given at the health centres .

There are 4 components of antenatal services under PMSMA which are to be provided at the PMSMA clinic that is held on 9th of every month. The first component is history and examination. All the 52 participants (100%) who attended PMSMA clinic, stated that their history was taken, height, weight and BP were measured and their clinical examination was done in the PMSMA clinic.

Table 1. Distribution of participants on the basis of socio-demographic variables

Variables	Frequency	%
Age		
16-25	117	72.7
26-35	44	27.3
Religion		
Hindu	153	95
Muslim	8	5
Caste		
SC/ST	22	13.6
OBC	41	25.5
Others	98	60.9
Educational status		
Illiterate	5	3.1
Primary	4	2.5
Beyond primary	152	94.4
Occupation		
Employed	9	5.6
Unemployed	152	94.4
Family type		
Nuclear	38	23.6
Joint / 3 generation	123	76.4
SES		
1	5	3.1
2	26	16.1
3	34	21.1
4	62	38.5
5	34	21.1
BPL card		
Yes	116	72
No	45	28

The second component of PMSMA is investigations. Hb estimation, HIV, HBsAg, random blood sugar and blood grouping and typing were done for all 52 participants (100%) while only 45 (86.5%) were tested for VDRL and urine routine and microscopy. None of the participants underwent ultrasonography at the PMSMA clinic. However, all of them stated that they had undergone USG scanning at private centres.

The third component of PMSMA is treatment. 52 (100%) of the participants stated that they had received injection TT, IFA and calcium tablets at the PMSMA clinic. 22 (42.3%) of the participants who had received ANC at PMSMA clinic were referred to higher centres for further care and treatment owing to the high-risk factors associated with their pregnancy.

The fourth component of PMSMA is counselling. Out of 52 mothers who had attended PMSMA clinic, 49 (94.2%) were counselled for nutrition and anemia, 47 (90.4%) were counselled regarding birth preparedness, 44 (84.6%) were counselled for lactation and 41 (78.8%) were counselled regarding family planning (Table 2).Awareness regarding PMSMA was seen in only 5% of the participants.

Table 2. Utilisation pattern of PMSMA

History and examination	Frequency	%
History	52	100
Height	52	100
Weight	52	100
BP examination	52	100
Clinical examination	52	100
Investigation		
Hb	52	100
HIV,HBsAg	52	100
VDRL	45	86.5
Urine (R)	45	86.5
RBS	52	100
Blood group	52	100
USG at PMSMA clinic	0	0
Treatment		
TT	52	100
2 doses	23	44.2
Booster dose	29	55.8
Folic acid	52	100
Iron capsule	52	100
Calcium tablet	52	100
Referral	22	42.3
Counselling		
Nutrition and anemia	49	94.2
Birth preparedness	47	90.4
Lactation	44	84.6
Family planning	41	78.8

This study found that the utilization of antenatal services in PMSMA clinic was more in the mothers who belonged to joint/three generation families and those who were aware regarding the program and its various components and services and this association was found to be statistically significant. (Table 3).

DISCUSSION

This is the first study in India to assess the utilization of antenatal services in PMSMA clinic and to study the factors associated with the utilization of these services.

A study done by Manju rani et al on the differentials in the quality of antenatal care in India found that blood pressure was measured in 40% women who received antenatal care in north India while in 87% in south India as compared to 100% in our study. Weight was measured in less than 33% of participants in north and in 80% in south India as compared to 100% in our study. Blood examination was done in 40% in north and 79% in south India, while in our study blood examination was done in all the participants in PMSMA clinic except for VDRL which was done in 86.5 % only. Urine examination was done in 38% in north and 77% in south India as compared to 86.5% in our study. IFA tablets were given to 89% in north while 95% in south

Table 3. Factors associated with utilisation of PMSMA

Factors	PMSMA	Routine	P value
Age			
16-25	38	79	0.936
26-35	14	30	
Religion			
Hindu	48	105	0.272
Muslim	4	4	
Caste			
SC/ST	8	14	0.836
OBC	14	27	
Others	30	68	
Educational status			
Illiterate	2	3	
Primary	1	3	0.89
Beyond primary	49	103	
Occupation			
Employed	2	7	**0.506**
Unemployed	50	102	
Family type			
Nuclear	18	20	0.023
Joint / 3 generation	34	89	
SES			
1	1	4	0.487
2	6	20	
3	10	24	
4	25	37	
5	10	24	
BPL card			
Yes	41	75	0.184
No	11	34	
Registration			
Early registration	49	100	0.701
Late registration	3	8	
Parity			
Primigravida	21	48	0.661
Multigravida	31	61	
PMSMA awareness			
Yes	50	10	< 0.001
No	2	99	

India as compared to 100 % in our study. Counseling on birth preparedness was given to 23% in north and 44% in south India as compared to 90.4% in our study.[8]

Sugunadevi G conducted a study on the quality of antenatal care services at subcentres and reported that 70.2% of patients were examined for height, 83.4% for weight, 87% for BP while in our study all the participants received these aspects of examination in PMSMA clinic.100% participants were reported to receive TT injection and IFA tablets which was found to be similar to the results in our study. 32.5% were counseled regarding nutrition as compared to 94.2% in our study.17.8 % were counseled regarding family planning as compared to 78.8% in our study.[9]

In our study, clinical examination was done for all the participants who attended PMSMSA clinic, while a study done on the quality of antenatal services in Kanpur reported weight examination in 74.9%, height measurement in 60.8%, BP examination in 66.2%, and clinical/obstetric examination in 76.4% of patients in ANC clinic. Hb estimation was done for 69.6% and urine examination for 50.2% of patients as compared to 100% and 86.5% respectively as reported in our study.[10]

A study in Manguluru by C.S.Vishnu et al on the utilization of antenatal services and supplementary nutrition during pregnancy reported similar findings for antenatal registration, weight and BP measurement and TT injection. 95% and 65% of patients had received advice on nutrition and birth preparedness as compared to 94.2% and 90.4% respectively in our study. PMSMA awareness was seen only in 5% of the participants as compared to 37% in our study.[11]

Kakati R et al conducted a study on the factors associated with the utilization of antenatal care services in rural areas of Assam. The utilization of antenatal care services was found to be significantly associated with age of mother at last birth, religion, caste, socio-economic status, and parity of mother and place and mode of delivery. While in our study the utilization of antenatal services was found to be significantly associated with only the type of family the lady belonged to and to the degree of awareness regarding the services.[12]

This study found low level of utilization of antenatal services under PMSMA in rural area of Belagavi. Quality of care was found to be good in those who attended PMSMA clinic. The utilization of PMSMA was significantly associated with the type of family and awareness of PMSMA. There is a need for improving community awareness on maternal health and for motivating women to utilize maternal care services under PMSMA by intensive IEC activities.

Only high-risk antenatal cases are seen in PMSMA clinic at our health centre. This might be the reason behind the low utilization of the antenatal services in PMSMA clinic at the PHC attached to BIMS. Hence the findings of this study cannot be generalized to get the information regarding utilization of PMSMA across the country.

This study has a limitation that the number of follow up visits in the PMSMA clinic have not been dealt with in this study.Future research on utilization of services in PMSMA in India could assess its acceptability in a broader variety of settings, and evaluate outcomes in facilities across the nation.

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Psychological well- being of women workers in a garment factory of South India-A cross sectional study

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ABSTRACT

Background: Working women are constantly facing the problems of role conflict or dual role. Due to role conflict, there are reports of psychological distress, mental tension, anxiety, etc, which affect the psychological well being of working women. Due to outside work, they have psychological problems such as anxiety, stress, burn out, fatigue, etc. This way, the mental health status of working women is neglected and hence, the present study **aims** to assess the psychological wellbeing of women in an industrial setup. **Methods:** A cross sectional study was done among women workers of 18 years and above. A standardized questionnaire was used to collect data. The data was analyzed using SPSS version 24. A total of 136 participants completed the study. **Results:** Present study showed that majority of the workers (67%) had low level of psychological well-being. **Conclusion:** Women workers have low level of psychological well-being and further studies are needed to understand factors influencing it.

Key Words: Psychological well-being, Women workers, Garment industry.

INTRODUCTION

"The mind is everything. What you think you become." – Buddha

According to the World Health Organization (WHO), mental health includes "subjective well-being, perceived self-efficacy, autonomy, competence, inter-generational dependence, and self-actualization of one's intellectual and emotional potential, among others". WHO further states that the well-being of an individual is encompassed in the realization of their abilities, coping with normal stresses of life, productive work and contribution to their community. [1]

Psychological well-being is a very subjective term meaning contentment, satisfaction with all elements of life, self-actualization (a feeling of having achieved something with one's life), peace and happiness.[2]Psychological well-being is defined as the presence of psychological and social skills and abilities that contribute to optimal functioning in daily life. [1]

The concept of mental health is inextricably linked to that of psychological well-being. A comprehensive model developed by C. Ryff provides an integration of different viewpoints. It encompasses six inter-related psychological dimensions: positive evaluation of one's self (Self-Acceptance), a sense of continued growth and development (Personal Growth), the belief that life is purposeful and meaningful (Purpose in Life), the possession of quality relations with others (Positive Relations with Others), the capacity to manage effectively one's life (Environmental Mastery), and a sense of self-determination (Autonomy). Lack of psychological well-being has been found to be a risk factor for depression. [3]

Garment workers around the world, especially those involved in tailoring, are predominantly women. The Indian garment industry is dominated by women workers and 80% of them are young women between 21-25 years. [4]

The workplace is one of the key environments that affect our mental well-being and health. It is difficult to quantify the impact of work alone on personal identity, self-esteem and social recognition; most mental health professionals agree that the workplace environment can have a significant impact on an individual's mental well-being. [5]

Working women have many problems such as career related problems, social problems such as domestic violence, health problems such as psychological distress due to role conflict, mental stress, tension, anxiety, physical health problems such as Anemia, arthritis, etc.

As discussed above, due to outside work, they have psychological problems such as anxiety, stress, burn out, fatigue, etc. This could lead to neglect of mental health. Hence this study is proposed with the objectives of

assessing the psychological well-being of women workers in garment industries and to find out its association with socio demographic factors.

MATERIALS & METHODS

A cross sectional study was conducted in a selected garment industry in Tirupur district of Tamilnadu state. This factory is mainly involved in manufacture of garments for export. Majority of the workers are unmarried women.

Sample size: Based on 63.5% prevalence of moderate level of psychological well-being study done by K.S.Velmurugan, Dr.K.Maheswari, in Tiruchirappalli [6] sample size was calculated as 136.

Inclusion criteria: There were 200 women workers above 18 years in our study factory. Prestuctured and pre validated questionnaire was administered to 136 women workers who were selected by simple random sampling.

Study tool: Carl Ryff's 18 item psychological well-being questionnaire translated into local language was used capturing various dimensions: autonomy, environmental mastery, personal growth, positive relations and self-acceptance, purpose in life. These items were measured using Likert scales of 1 to 6, with 1 indicating strong disagree and 6 indicating strong agree. The maximum score for psychological well-being that could be obtained under each dimension is 18.The maximum score that could be obtained for overall psychological well-being is 128.

Data collection: Data collection was done using the above tool as self administered questionnaire. Data entry and analysis was done using Statistical Package for Social Sciences (SPSS) version 24. The data were analyzed by using mean, standard deviation and two-way analysis of variance (ANOVA) and p <0.05 was considered statistically significant.

Ethical Issues: Approval for the study was obtained from the Institutional Human Ethics Committee of PSG Institute of Medical Sciences and Research.

RESULTS

A total of 136 participants completed the survey. The study participants were in the age group of 18 to 25 years. The participants were representative of different sections of the factory with majority (45%) being tailors. The demographical details of the participants are shown in Table1.

Table 2 shows the mean scores of the participants under each dimension of psychological well-being. For all dimensions the mean score was 12 and below which indicates low psychological well-being. The findings indicated that workers scored high in personal growth (M= 12.02, sd= 4.05) and least in environmental mastery (M=10.10, sd=4.05).

Table 1: Demographic details of the participants

Demographic factors	Percentage
Age	
Below 20 years	58%
Above 20 years	42%
Education Qualification	
High school	48%
Hr.sec.school	40%
Diploma	4%
Graduate	8%
Work experience	
Below 1 year	57%
Above 1 year	43%
Type of family	
Nuclear family	73%
Joint family	27%
Residence	
Hostel	97%
Day scholar	3%

Table 2: Overall level of workers Psychological well-being

Indicators of Psychological well-being	Mean±SD
Autonomy	11.50±3.39
Positive relations	11.92±2.37
Self-acceptance	10.13±3.52
Environmental mastery	10.10±4.05
Purpose in life	11.66±2.24
Personal growth	12.02±4.05
Total score	67.36±13.20

Table 3: Association of various factors with psychological well-being

Socio economic Factors	Total score of Psychological well-being (Mean±SD)	p value
Age		
Below 20 years	67.69±12.74	0.728
Above 20 years	66.89±13.91	
Education Qualification		
High school	68.39±13.26	
Hr.sec.school	67.59±13.14	
Diploma	68.20±14.06	0.241
Graduate	59.63±11.84	
Work experience		
Below 1 year	67.02±12.26	0.733
Above 1 year	67.81±14.46	
Type of family		
Nuclear family	67.02±13.00	0.625
Joint family	68.27±13.84	

Table 3 shows the association of various demographic variables with psychological well-being. Age was categorized less than 20 and more than 20, also between various educational level and work experience of at least a

year and whether they belonged to nuclear or joint family. The findings indicated that there is no significant difference between demographic factors like age, education and years of education with psychological well-being.

DISCUSSION

The present study showed that overall psychological well-being of women garment workers was low (mean value 67.36). In garment industry women workers work for longer hours (10 hours). Also due to high production pressure, hourly targets are set for workers. Staying away from family and having long working hours could be reasons which need to be explored.

Our study findings revealed relatively higher score for personal growth compared to other dimensions. It indicates that women workers had more positive feelings towards their continued development and ready to experience new challenges in life. Similarly, a study done on 2015 showed that a high score in personal growth and positive relations subscales. [7]

The result of present study concurs with a similar study done in Perambalur which showed that women in higher age have low psychological well-being. In our study there is no significant difference between workers age & their psychological well-being. But a woman with higher age shows low psychological well-being. In the same study it was found that women with more work experience had higher psychological wellbeing. In our study though not significant the mean score was comparatively higher among women with more work experience. [6]

In our study we couldn't find out any reasons for poor psychological well-being. Instead, we say above mentioned reasons could be the reason for poor psychological well-being. The present study concurs with a similar study, done in Mysore where the mean score for psychological well-being was 193. [8]

Conclusion and way forward

From the study we conclude that psychological well-being is low among women workers. Management should develop policies for addressing mental health issues and creating access to counseling services.
Though quantitative analysis did not reveal statistical association between psychological well-being and demographic profile, further qualitative studies would help in better understanding the factors influencing psychological well-being.

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Perception of doctor-patient relationship among undergraduate medical students in a medical college of West Bengal

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ABSTRACT

Background: Doctor-patient relationship is the central pillar of medical care, which affects patients' psychological, social and biological outcomes. Medical undergraduate students need to develop one to one relationship with patients. The objective of the present study was to assess the sharing and caring dimensions of the doctor-patient relationship using the Patient-Practitioner Orientation Scale (PPOS) and to analyze any difference across the demographic characteristics, of the undergraduate's medical students. **Materials & Methodology:** We did an observational descriptive cross-sectional study in a tertiary medical college of West Bengal. We used one to one interview technique as a study technique using an interview schedule consisting of sociodemographic characteristics, patient-practitioner orientation scale (PPOS). **Results:** Male participants constituted 59%, that is 133, whereas females were 93 (41%). Mean PPOS score was 3±0.62, Mean sharing score was 3±0.63, mean caring score was 3±0.61. Results showed significant difference across gender where female scored higher in mean sharing (2.99±0.61 vs 3.35±0.63), caring (2.82±0.58 vs 3.02±.70) & total PPOS score compared to males (2.90±0.58 vs 3.1±0.67) (p=0.00). Students from the urban locality had a significantly higher score in sharing (3.16±0.64 vs 2.92±0.49), and the total score (3.04±0.66 vs2.87±0.51) compared to rural students. **Conclusions:** This study gave the idea about the perception of the doctor-patient relationship among medical students of a Medical college of West Bengal. Keeping in mind this baseline score, we suggested strategies to improve doctor-patient relationships. Various teaching leaning tools could be incorporated, and contextualised case-scenarios and role plays could be framed so that proper relationship could be built.

Key Words: perception, doctor-patient relationship, medical undergraduates

INTRODUCTION

The doctor-patient relationship is one of the core elements of medical care, which affects the patient's outcome. This is a both-way social communication which is determined by the behaviour of both the physician and the patient concerned.[1] The physician always provides physical, mental & emotional support to the patient. Good doctor-patient relationship contributes significantly to the effectiveness of treatment. Over the years, the health services provided are entirely focussed on the decision of the doctor. In the paternalistic model of the doctor-patient relationship, a doctor is a dominator and advise patient according to their expertise without taking into consideration of patients' perspective. The patient is considered to be a poor decision maker for treatment strategies. But these days, the dynamics has changed from a largely passive to an active one due to many reasons.[2] The burning issues that the medical education system urgently need to look into are that modes of effective communication between doctors and patients and a rapid rise in the demand of patients' autonomy.[3] Good communication consists of both verbal and non-verbal components. A major portion of the communication involves non-verbal components like head node, smile, eye-contact etc. which is mostly lacking in any typical doctor-patient communication.[4] India has the highest number of medical colleges in the world.[5] This leads to a different benchmarking system in different colleges. The globalisation of the medical education system identified many more core domains to be scrutinised. Among these doctor-patient relationship remains to be the most important as this is one of the strong pillars in medical education. Despite many well-documented finding, medical colleges teach very few domains of soft skills compared to technical domains. Many pieces of research have shown that regressive attitudes are on the rise as they gradually promote to upper semesters. Views came up that as soft skills come under the hidden curriculum, many negative lessons are taught unintentionally.[6]

The doctor-patient relationship is the foundation of contemporary medical ethics. Patients must have confidence and respect so as the doctors should build a good rapport to convince them. MCI has laid down AETCOM module for preparing medical undergraduates good in communication skills. Before implementing this

module, there is a need to understand the baseline assessment of the doctor-patient relationship of medical undergraduates of this institution so that strategies can be adapted accordingly. With this view in mind, this study has been designed to find out the socio-demographic characteristics of medical undergraduates participated in this study, to assess sharing and caring dimensions of the doctor-patient relationship using the Patient-Practitioner Orientation Scale (PPOS) and to analyse any association of the sharing, caring and total score with the demographic characteristics.

MATERIAL & METHODOLOGY

This was an observational descriptive study of cross-sectional design conducted in a tertiary medical college of West Bengal. Study population consisted of undergraduate medical students of the institution. All 400 undergraduate medical students were approached in lecture halls, hostels and campus wherever possible and those who found to be absent and did not give consent were excluded. Study duration consisted of three months. Verbal consent was obtained after the purpose of the study was explained. One to one interview was done using an interview schedule consisting of sociodemographic characteristics, PPOS (patient-practitioner orientation scale). PPOS was created by Krupat et all in 2000, consisting of 18 questions. They were subdivided into two subscales such as sharing and caring. Sharing referred to the concept that the patient was supposed to share power in decision making process regarding management. Caring referred to the concept that a patient was supposed to be seen with emotions rather than a condition or disease. Each statement was given options using 6 point Likert scale of strongly agree, somewhat agree, agree, disagree, somewhat disagree, strongly disagree. For each question minimum score allotted as 1 and maximum allotted as 6. A higher score indicated more patient centred attitude whereas lower score indicated more doctor centred attitude. Internal consistency of the scale was found to be 0.91. Participants were reassured about their anonymity and participation was completely voluntary & they could drop at any time. Data so collected were checked for consistency & completeness. Then was analysed using SPSS version 20. Data were presented in percentages, mean with standard deviation. Independent Students t test was used to measure the mean score differences across various socio-demographic characteristics.

RESULTS

Out of 400 students, 226 medical undergraduates participated in the study giving a response rate of around 56%. Male participants constituted 59%, that is 133, whereas females were 93 (41%). Hostelers were more in number compared to day-scholars (134 vs 93). Majority of the respondents were from urban community 178 (78.7%). Almost equal representation from all the semester students was present. Mean PPOS score was 3±0.62, Mean sharing score was 3±0.63, mean caring score was 3±0.61.

Table 1: Sharing components among medical undergraduates (N=226)

PPOS questions	Mean Score ± SD
Doctor is the one who would decide what gets talked about during a visit	2.2 ± 1.29
Although healthcare is less personal these days, this is a small price to pay for medical advance	2.8 ± 1.27
The most important part of a standard medical visit is the physical examination	2.4 ± 1.23
It is often best for the patient if they do not have a full explanation of their medical condition	3.4 ± 1.43
Patient should rely on their doctors' knowledge & not try to find about their conditions on their own	2.6 ± 1.39
When doctors ask a lot of questions about patients' background, they are prying too much into personal matters	4.2 ± 1.35
If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important	3.8 ± 1.29
Many patients continue asking questions even-though they are not learning anything new	2.7 ± 1.15
Patients should be treated as if they were partners with the doctors, equal in power and status	3.2 ± 1.34

Table 2: Caring components among medical undergraduates (N=226)

Caring Variables	Mean Score ± SD
Patients generally want reassurance rather than information about their health	2.49 ± 1.1
If a doctor's primary tool is being open and warm, the doctor will not have a lot of success	3.87 ± 0.64
When patients disagree with their doctor, this is a sign that the doctor does not have the patients respect and trust	3 ± 1.3
A treatment plan cannot succeed if it is in conflict with a patient's lifestyle or values	2.53 ± 1.08
Most patients want to get in and out of the doctors' office as quickly as possible	3.04 ± 1.26
The patient must always be aware that the doctor is in-charge	2.51 ± 1.16
It is not that important to know a patient's culture and background in order to treat patients' illness	3.97 ± 1.46
Humor is a major ingradient in the doctor's treatment of the patient	2.43 ± 1.13
When patients look up medical information on their own this usually confuses more than it helps	2.23 ± 1.06

Table 3: PPOS obtained by participants across socio-demographic characteristics (N=226)

Socio-demographic characteristics	Sharing score Mean ± SD	P value	Caring score Mean ± SD	P value	Total score Mean ± SD
Gender					
Male	2.99±0.61	0.00*	2.82±0.58	0.02*	2.90±0.59
Female	3.35±0.63		3.03±0.70		3.19±0.67
Area of residence					
Urban	3.16±0.64	0.00*	2.92±0.64	0.06*	3.04±0.63
Rural	2.92±0.49		2.78±0.54		2.87±0.51
Place of residence					
Day-scholar	3.18±0.66	0.34	2.90±0.64	0.9	3.04±0.66
Hostelite	3.10±0.58		2.91±0.66		3.01±0.58

Students t test , * significant (p<0.05)

Table 1 shows the mean scores of sharing component in PPOS score where it was observed that highest mean score among the sharing components was obtained by the statement that when doctors asked many questions about patients' background, they were prying too much into personal matters which was 4.2±1.35 followed by the statement that if doctors were truly good at diagnosis and treatment, the way they related to patients was not that important (3.8±1.29). Mean score of the statement that it was often best for the patient if they did not have a full explanation of their medical condition was 3.4±1.43. The lowest score was obtained by the item that doctor was the one who would decide what to talk about during a visit, i.e. 2.2±1.29

Table 2 shows the mean score of caring components in PPOS score. In the caring component highest score was obtained by the statement that it was not that important to know a patient's culture and background to treat patients' illness (3.97±1.46). Next item which obtained the highest score was that if a doctor's primary tool was being open and warm, the doctor would not have a lot of success 3.87±0.64. The lowest score was obtained by the statement that when patients looked up medical information on their own this usually confused more than it helped i.e. 2.23±1.06.

Table 3 shows that difference in mean score in sharing, caring & total score in PPOS across different socio-demographic characteristics. It shows significant difference across gender where female scored higher in mean sharing (2.99±0.61 vs 3.35±0.63), caring (2.82±0.58 vs 3.02±.70) & total PPOS score compared to males (2.90±0.58 vs 3.1±0.67) (p=0.00). Students from urban locality has significantly higher score in sharing (3.16±0.64 vs 2.92±0.49) and total score (3.04±0.66 vs2.87±0.51) compared to rural students. There was no significant difference between day-scholars and hostelers in sharing, caring & total score.

DISCUSSION

This study attempted to find out the doctor-patient relationship among medical students which showed the mean PPOS score was 3±0.62 which was similar to the findings conducted by Balaji A et al. Similar mean scores have been obtained in sharing and caring components.[7] Where studies conducted in western countries reported higher sharing as well as total score that could be because patients' autonomy was always given top most priority in countries like America whereas in Asian context still patients' decision never being considered assuming their ignorance.[8]

Sharing statements with mean highest score consisted of disadvantages in prying into personal details as well as concentrating on only at diagnosis and treatment which was considered as doctors' job. In caring component, emphasis was given on not knowing patients' cultural background, doctors primary tool not being open and warm & patient should not look up for more information. The reason behind that could be because of the implicit hidden curriculum as principals of doctor-patient communication had never been traditionally taught to the medical undergraduates. Another important factor could be because most of the non-technical skills are attained by role modelling from other senior staffs, many a times, student perceived in a wrong direction. Many researches had shown that more than 90% of the doctors in government setting did not take consent from the patients as well as less than 11% of the patients had the right to informational privacy.[9] This might had led to the creation of the environment that was detrimental to undergraduate medical training. Many students were not aware about the right of the patients and consequently they never felt the need of sharing the components. Many studies had shown the reason to be as stress as driving force for the doctor-centred approach or disease entered approach. Many undergraduate medical students suffered from anxiety, depression, stress and significantly associated with reduced patient care practice.[10,11]Another important factor which hindered doctor patient relationship happened to be the language as mostly medical science in India used to be taught in English but when doctors used to communicate in real field, mostly local vernacular language had been used. Many medical terminologies utilised happened to be very difficult to explain in local language and that led to further worsening of the situation. Orientation to local language could have solved the problem to a large extent. The societal structure of Asia happened to favour more towards the paternalistic behaviour of doctor leading to poor doctor-patient relationship.

In our study, female students had higher PPOS score than males as similar to several other studies. A study conducted in Nepal reflected the findings similar to our study where female gender were significantly more patient-centred compared to male gender.[12] Study conducted in Korea also noticed females had higher PPOS score than males.[13] Similar findings had been noted in many other study findings.[14,15]

Urban students scored more compared to the rural counterparts in sharing components that could be explained by the fact that because of the media exposure, urban students used to be more aware about the rights of patients.

Study had a limitation of being a single institution based which lack in generalisation. Further studies exploring this doctor-patient domain in multiple institution are recommended. This study could also be limited by social desirability bias. Observation of the medical students with structured checklist would have been an appropriate method for analysis. Poor response rate has also led to poor generalizability. Further studies are recommended with more representation and other associated factors.

Conclusion: This study had given the idea about the perception of doctor patient relationship among the

undergraduate students of a Medical college of West Bengal. Modern medical care environment is complex leading to increased number of litigations. In Asian context, burden of medical information is double-edged. Majority of them are not aware about medical facts as well as accessibility of medical information through internet sometimes lead to information overcrowding. Problems get coupled up with poor infrastructure as well as less of manpower from health system. This study provides the base line perception of budding doctors about doctor-patient relationship who soon will be working in the field. Keeping in mind this baseline score, strategies to improve the doctor patient relationships can be formulated. Various teaching leaning tools can be incorporated, and contextualised case-scenarios and role plays can be framed so that proper relationship can be built. Overall, good doctor-patient relationship will always leads to the greater benefit of the society.

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