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Nutritional Assessment of Children in the 3 –5 Years of Age Group in Karaikal District, Pudhucherry.

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ABSTRACT :

Introduction: The magnitude of the problem of malnutrition among children under five years of age is high throughout in India. Malnutrition and Infection are the two most important factors that affect the growth of children. This study explains the extent of malnutrition and prevalence of wasting and stunting among pre-school children in Karaikal. **Material& Methods:** The cross sectional study covered the age group 3-5 years who are studying in the 27 Government Pre-schools of Karaikal during the academic year 2007 – '08. The total Sample Size was 683. Height, weight, skin, and mid-arm circumference were measured as per WHO guidelines. **Results:** As per Gomez's classification(Weight - for – Age) 10.79% of children in 36-48 months and 15.61% in 49-60 months were moderately malnourished; As per Waterlow's classification(.Height – for –Age) moderate stunting was 2.90% and 2.04%; as per Waterlow's (Weight – for – Height) moderate wasting was 2.49% and 3.39% in these groups. Moderate malnourishment seen in 14.77% of boys and 12.99% of girls; Moderate wasting seen in 3.41% of boys and 2.72% of girls; Moderate stunting seen in 2.56% of boys and 2.12% of girls; As per mid – upper arm circumference 2.9% were severely malnourished. **Conclusion:** Only 30% of the children enjoy normal nutritional status as per weight for age. 36 % of the children suffer from Chronic Malnutrition as per height for age. There is Acute Malnutrition ranging from Mild to Moderate degree, which demands immediate increase in the quantity of Nutrition provided to the children.

Key Words: *Malnutrition, Karaikkal, Gomez, watrelow.*

Introduction:

Malnutrition and Infection are the two most important factors that affect the growth of children. In most cases of childhood infections, the cause can be traced to insufficient food intake or absorption, which renders the human system vulnerable to infections.

The magnitude of the problem of malnutrition among children under five years of age is high throughout in India. The National Family Health Survey-III data projected that Almost half of children under five years of age (48 percent) are stunted and 43 percent are underweight. The proportion of children who are severely undernourished is also notable: 24 percent are severely stunted and 16 percent are severely underweight. Wasting is quite a serious problem in India, affecting 20 percent of children under five years of age. Very few children under five years of age are overweight[1]. More than the infections caused to the body by malnutrition, the severe to mild mental retardation suffered by children need to be highlighted. It is now an established fact that the brain undergoes development and growth within the first five years of a child's life. Therefore,

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malnutrition of children under 5 yrs will surely lead to reduced mental abilities affecting the intellectual capabilities of the children when they reach adulthood. Another study conducted in a maternal and child health center, pointed out that 71.5 % children were underweight as per weight for age while 70.1 % and 62.7% of children had deficit in height for age (stunting) and weight for height (wasting) respectively[2]. Considerations such as quoted above prompted us to undertake a study on the Pre-school children in the age group 3 –5 yrs studying in the government schools of Karaikal, to trace out the extent of malnutrition and prevalence of wasting and stunting in them.

Material and Methods:

Study Area: The area adopted for this study is the district of Karaikal. It belongs to Union- territory of Pondicherry along the Coasts of Bay of Bengal in India. It has about 6 Communes that are grouped into 2 zones by the Educational Department. About 27 Government Pre-schools were picked from both the zones at random for this study. **Study Population:** The study covered the age group 3-5 years who are studying in the Government Pre-schools of Karaikal during the academic year 2007 – '08. The total Sample Size was 683. **Study Design:** It is a Cross-sectional descriptive study to assess the nutritional status among children in the age group of 3-5 years. Anthropometrical methods were used for the assessment of malnutrition in this study. The data collected were assessed with reference to WHO Standards for Growth according to Weight – for – Age, Height – for – Age and Weight – for - Height. The 25th percentile in the WHO Standard has been taken up as the reference value for the assessment of malnutrition in this study. **Assessment methods: Anthropometry:** Height, weight, skin, and mid-arm circumference were measured as per WHO guidelines. The four parameters used in this study are given below.

1. Weight - for – Age (GOMEZ' CLASSIFICATION) [11]
2. Height – for – Age (WATERLOW'S CLASSIFICATION)
3. Weight – for - Height (WATERLOW'S CLASSIFICATION)
4. Mid – Arm – Circumference

Results:

The present study included 683 children in the age group of 3-5 years comprising 352 boys and 331 girls enrolled in the Government Pre-schools in the district of Karaikal during the academic year 2007 – '08. The entire study population was divided into two groups based on age. Children between 36 and 48 months comprised of the first group and children between 49 and 60 months in the second group. (Table 1)

Table 1: Age and Sex wise distribution of the study population:

AGE /SEX	Boys (%)	Girls (%)	Total (%)
36-48 Months	125 (35.51)	116 (35.04)	241 (35.28)
49-60 Months	227 (68.49)	215 (64.96)	442 (64.72)
Total	352(100)	331(100)	683(100)

Table 2: Age wise distribution of various degrees of malnutrition according to Gomez' classification.

Nutritional Status/AgeGroup	36 - 48 Months(%)	49 - 60 Months(%)	Total (%)
Severely malnourished	0	0	0
Moderately malnourished	26 (10.79)	69 (15.61)	**95 (13. 91)**
Mildly malnourished	139 (57.68)	203 (45.92)	**342 (50.07)**
Normal	76 (31.53)	170 (38.47)	**246 (36.02)**
Total	241	442	**683**

57.68 % of children in 36-48 months and 45.92% in 49-60 months were mildly malnourished. (Table 2).

Table 3: Sex wise distribution of various degrees of malnutrition according to Gomez' classification

Nutritional Status/Sex	Boys (%)	Girls (%)	Total (%)
Severely malnourished	**0**	**0**	**0**
Moderately malnourished	52 (14.77)	43 (12.99)	**95 (13.91)**
Mildly malnourished	175 (49.72)	167 (50.45)	**342 (50.07)**
Normal	125 (35.51)	121 (36.56)	**246 (36.02)**
Total	**352**	331	683

Nutritional status was almost same among boys and girls .in the present study.

Table 4: Age wise distribution of wasting according to Waterlow's classification using the weight for height parameter.

Level of wasting/Age Group	36 –48 months (%)	49 –60 months (%)	Total (%)
Severe wasting	0	0	0
Moderate wasting	6 (02.49)	15 (3.39)	**21 (3.07)**
Mild wasting	50 (20.75)	120 (27.15)	170 (24.90)
No wasting	185 (76.76)	307 (69.46)	**492 (72.03)**
Total	241	442	**683**

Wasting was observed in about 28 % of the children. Wasting was higher in the 49 – 60 months age group than that of the 36 – 48 months age group. However the presence of moderate wasting was negligible.

Table 5 : Sex wise distribution of wasting according to Waterlow's classification using the weight for height parameter.

Level of wasting/Sex	Boys (%)	Girls (%)	Total (%)
Severe wasting	**0**	**0**	**0**
Moderate wasting	12 (3.41)	9 (2.72)	21 (3.07)
Mild wasting	95 (26.99)	75 (22.66)	170 (24.89)
No wasting	215 (69.60)	247 (74.62)	492 (72.04)
Total	**352**	331	683

30% of boys and 25% of girls suffered from wasting. However severe form of wasting was not observed in any of the children. (Table 5)

Table 6: Age wise distribution of stunting according to Waterlow's classification using the height for age parameter.

Level of stunting/Age Group	36 –48 months (%)	49 –60 months (%)	Total (%)
Severe stunting	0	0	0
Moderate stunting	7 (2 .90)	9 (2 .04)	16 (2.34)
Mild stunting	82 (34.02)	153 (34.62	235 (34.41)
Normal	152 (63.08)	280 (63.34)	432 (63.25)
Total	241	442	**683**

36 % of children in both age groups suffer from mild and moderate stunting. Severe stunting was not observed in both the groups. (Table 6)

Table 7: Sex wise distribution of stunting according to waterlow's classification using the height for age parameter.

Level of Stunting/Sex	Boys (%)	Girls (%)	Total (%)
Severe stunting	0	0	0
Moderate stunting	9 (2.56)	7 (2.12)	16 (2.34)
Mild stunting	129 (36.65)	106 (32.02)	235 (34.41)
Normal	214 (60.79)	218 (65.86)	432 (63.25)
Total	352	331	**683**

Stunting among boys was higher i.e. 39.2% when compared to girls with 34.1 % and no cases of severe stunting was found. (Table -7)

Table 8: Assessment of malnutrition using mid – upper arm circumference:

Nutritional Status	No of children	Percentage
Severely malnourished	20	2.9%
Moderately malnourished	122	17.9%
Normally nourished	541	79.2%
Total	683	100%

Based on mid arm circumference 2.9%, were severely malnourished and 17.9 % were found to be moderately malnourished. (Table 8).

Discussion:

More than 26,000 children under the age of 5 die around the world each day mostly conditions due to preventable causes. Nearly all of them live in developing countries or, more precisely in 60 developing countries[12]. The under-five mortality rate of them living in developing countries is 79 per 1000 live births in the year 2006[13]

Despite significant improvement in food production and advancement in Science, India still accounts for about 21 % of the under-five children dying in the World. Malnutrition continues to be a widespread problem in India[12]. Considering these facts, this study was undertaken in Karaikal, a coastal area in Southern Part of India. The Results of this study are discussed below.

I. Gomez' classification of malnutrition:

Under-weight children have been identified by measuring their Weight for Age. This is a Height independent index and is an indicator of Malnutrition. The Age-Sex Cross tab for Gomez' classification (Table 4) clearly shows that mild to moderate Malnutrition is definitely present in two-thirds of the children. Both boys and girls in 3-5 years age group equally suffer from first degree to second degree of malnutrition. Only 30% of the children enjoy normal nutritional status.

II. Waterlow's Classification of Malnutrition:

(i)Wasting: Wasting is an Age-independent index and it reflects acute Nutritional Deprivation of shorter duration. Weight-for-Height correlation, according to Waterlow's classification indicates that 30 % of the children suffer from mild to moderate wasting. Wasting is slightly more prevalent in boys than in girls. Wasting was observed more in the older age group. Children in Group I showed 2.49 % of Moderate Wasting and 20.75 % of Mild Wasting, while 3.39 % of Moderate Wasting and 27.15 % of Mild Wasting were observed in Group II.

(ii) Stunting: Stunting is a Weight independent index and indicates chronic type of Malnutrition. The Height-for-Age Malnutrition according to Waterlow's classification shows that irrespective of Age differences, 36 % of the children suffers from Chronic Malnutrition. The level of stunted growth is present more among the male children than in female children.

The National and State Governments have been implementing a number of poverty alleviation programs for the overall socio-economic development of the community and several programs to mitigate the sufferings of the vast multitudes of the population at risk. As a result of this, the under-five mortality rate has come down considerably. The

mortality rate of under-five children in India per 1000 was 119 in 1993, 101 in 1999 and 85 in 2006 [14].

About 70% need Nutritional Enhancement, because they are in the Under-weight category. There is Acute Malnutrition ranging from Mild to Moderate degree, which demands immediate increase in the quantity of Nutrition provided to the children. There is 36 % of Chronic Malnutrition, which indicates that Under-nutrition must be at present prevailing even in the age of less than 3 years children who have not been covered by this study.

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Conflict of Interest: Nil

LETTER TO THE EDITOR

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Undergraduate Medical Research in India - The Missing Domain

Brahmaiah Upputuri[1] and Satya Prasad Venugopal[2]

Respected Madam,

The article on *Undergraduate Medical Research - The Essential Domain*[1] highlights the importance of undergraduate medical research in India. We appreciate the commendable effort put in by the author to enlighten the famous medical student's discoveries. In India, Undergraduate medical research is far from satisfactory. This has been proved by a recent study from south India indicating that nearly 70% of undergraduate students are unaware of research though their level of awareness had a range[2]. With the time constraints of the MBBS curriculum, least number of students is interested in research activities. Emphasis on importance should be made to these students as they are the contributors to the medical science in future.

We feel that though STS (short term studentship) by Indian Council of Medical Research and the Department of Science and Technology (DST) KVPY (kishore vaigyanik protsahan yojana) are doing a lot for the cause, they need to be more publicised especially DST's KVPY programme. In 2010 790(18.3%) students got selected for ICMR – STS, of them 662(83.7%) students were able to submit their report in time and in 2011 out of 802 selected students only 654(81.5%) students submitted their report in time[3]. Focus should be made on those students who unable to submit their reports.

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Other programmes include Indian Academy of Sciences Summer Research Fellowship Programme (SRFP) and TIFR's VSRP (Visiting Students' Research Programme) very few students are opting as it requires complete two months to spend on project which is very difficult for medical student ignoring their clinical postings. Actually the best

students should cash on this and make their intelligence to benefit the scientific community by interacting and working with scientists of international reputation.

Interest also needs to be inculcated in the minds of students as most of the students consider research as a distraction and waste of time due to heavy burden of MBBS curriculum and with an aim to crack post graduation seat in first attempt and in India, research projects are not considered for when applying for Post graduation[4].

It is very important in any research to make the presentation of the work and the new finding. The emphasis should be laid to motivate the student to present their work. In India MEDICON organised by INFORMER and regional/zonal medical conferences for ICMR and KVPY recipients organised by Padmasri Dr.Deo of Moving Academy of Medical Sciences encouraging young medicos to show case their work.

Student section in the journals provides a platform for understanding the process of scientific publication. The author has listed the journals which is a matter for appreciation and as well as a point to be noted for increasing the awareness of the research among the students.

Exposure to the basics of medical research at an earlier stage at the undergraduate level not only improves knowledge and attitude towards the research but also can enhance the skills of the student in searching and critically analysing literature, improves independent thinking and providing proper guidance at a very early stage can fast-track future researchers[5].

To conclude, including short research projects in subject like Preventive and Social Medicine / community medicine as a component of internal assessment, students will be definitely encouraged to do meaningful and productive research apart from learning the basics of biostatistics and every STS scholar should be made to present his/her work as a part of research training.

It is time now to encourage, acknowledge the student research and credit it accordingly.

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SHORT ARTICLE - I

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High Risk Sexual Behaviour among Long Distance Truck Drivers: a Cross sectional study

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Abstract:

Aims: To assess the knowledge of truck drivers about HIV transmission & prevention and to understand the sexual behaviour of these drivers with reference to HIV / AIDS. **Methods and Material:** Cross sectional study was conducted on Lucknow highway in Bareilly district of Uttar Pradesh State. Age, marital status, education, income, consumption of alcohol, length of stay away from home, knowledge about transmission & prevention of HIV, and HIV prone behaviour of truck drivers were studied. Chi square, mean and SD were calculated. **Results:** 289 (97.6%) drivers had heard about HIV/AIDS. Only 242 (81.8%) were aware of HIV transmission by heterosexual route. Misconceptions about HIV transmission through mosquito bites, living in same room, shaking hands and sharing food were found. Out of 174 (58.8%) who visited Commercial Sex Workers, 146 (83.9%) used a condom. 38 (12.8%) visited more than 5 CSW in last 3 months. Time away from home on the road, marital status, alcohol use and income class was associated with visiting CSW. **Conclusions:** High risk behaviour was established in the study population. Safe sex and consistent use of condoms needs to be promoted among the truck drivers and better condom availability needs to be assured on highways.

Key-words: HIV/AIDS, Knowledge, Sexual Behaviour, Truck Drivers.

Introduction:

Evidence in India and elsewhere shows that the community of truckers is vulnerable to HIV due to a higher prevalence of risky sexual behaviour, which results from a variety of social and economic factors as well as their work patterns.[1] National AIDS Control Program III (2007 -2012) has given high priority to address the susceptibility of truck drivers for the exposure to HIV infection[2]. In India HIV /AIDS has entered into third decade, not as a single epidemic but made up of a number of distinct epidemics. The epidemic shifts from the highest risk groups (Commercial Sex Workers, Men having sex with men and Intra venous drug users) to bridge population like clients of sex workers, truck drivers, migrant population, etc., and then to general population[3]. Truck drivers constitute a well known bridge population for the infection and transmission of HIV/AIDS. Due to migratory nature of work for truck drivers, making them stay away from their families, leads to their visiting CSW. Some studies have documented their knowledge and behaviour[4].

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There has been a gradual increase in knowledge of truck drivers about HIV / AIDS. The present study takes various variables like age, education, marital status, consumption of alcohol, income and length of stay outside home, and tries to examine the association with HIV Prone Behaviour among truck drivers.

Materials and Methods:

Present study was conducted on Lucknow Highway *Dhabas* (small roadside restaurants) near Faridpur town, Bareilly District, Uttar Pradesh state. A simple random sampling for the dhabas was done and 4 out of total 9 dhabas were selected for the study. The prevalence of high risk sexual behaviour among truck drivers was around 58% as per previous studies.[4] Using this we applied the formula of $4pq/d^2$ to get a sample size of 289 for the study. Data was collected on Sundays from 11 AM to 3 PM (lunch time) from March to July 2010. All the interviewers were trained for administering the questionnaire by conducting supervised trial interviews. The study was presented before and was approved by Institutional Ethical Committee of Rohilkhand Medical College and Hospital. All the truck drivers who stopped at the *dhabas* were approached for participation in the interview, and those who consented-oral or written informed were taken aside to a separate enclosure to maintain their privacy and confidentiality. On the first day the questionnaire was tested, and some modifications made based on the experience of the interviews. Interviewers were careful not to include the same driver twice by first finding out if they had been interviewed before. After the completion of interview the truck drivers were educated about various modes of acquiring HIV infection and preventing HIV infection using condoms and given free condoms if they asked for it. Total 296 interview forms were included in the final analysis.For the purpose of this study life time exposure to CSW and alcohol was taken as 'Yes', even if the exposure occurred long time ago. Changed behaviour has not been taken into account as it was difficult to document and define. Many drivers admitted to their behaviour being changed with age, marriage, change of routes etc. but documenting this kind of change was out of the scope of the study.

Results:

***Socio-demographic profile*:** Mean age of truck drivers was 32.52 years (range 17-62 years). 62 (20.9%) were less than 25 years of age, 140 (47.3%) were between 25-35 years, 79 (26.7%) were between 36-45 years and 15 (5.1%) were more than 45 years of age. Their mean income was Rs 7946.62. One hundred three (34.8%) had income less than or equal to Rs. 5,000, and 84.8% had income less than or equal to Rs. 10,000. For the purpose of analysis we divided the drivers in three income groups, lower (103, 34.8%) earning less than Rs5,000, middle (148, 50%) earning Rs5-10,000 and upper (45, 15.2%) earning over Rs10,000 per month. One hundred twenty (40.5%) of the drivers were from the state of Uttar Pradesh, 69 (23.3%) from Haryana, 41 (13.9%) from Punjab, 18 (6.1%) from Uttarakhand and rest were from other states. 231 (78%) drivers were married. 200 (67.6%) consumed alcohol. 103 (34.8%) had studied till fifth class or less, 161 (54.4%) drivers had studied from sixth to tenth class and 32 (10.8%) had studied more than tenth class.

Truck drivers showed the pattern of distance journey that took them away from home on the road. This pattern was seen in most drivers and length of time away from home is not just for the current journey but for general pattern for a particular driver. In a month, only 6(2%) were away from home for less than five days; Twenty (6.8%) were away for 6-10 days, 106 (35.8%) were away for 11-15 days, 85 (28.7%) were away for 16-20 days and 79 (26.7%) were away for more than 20 days. For the purpose of analysis we divided the drivers in two groups; those who stay away from home for 15 days or less (132, 44.6%) and those who had been away for more than 15 days (164, 55.4%).

Knowledge about HIV/AIDS: 289 (97.6%) driver had heard about HIV/AIDS. 242 (81.8%) were aware of HIV transmission by heterosexual route if condom is not used

Table 1 Time away from Home, Marital Status, Alcohol Use, Income Class & visit to CSW

			Visited CSW		Total
			No	Yes	
Time Away	<15 days	Count	44	88	132
from Home		%	33.3%	66.7%	100.0%
on the Road	>15 days	Count	78	86	164
		%	47.6%	52.4%	100.0%
Total		Count	122	174	296
p<.05		%	41.2%	58.8%	100.0%
Marital Status	Married	Count	104	127	231
		%	45.0%	55.0%	100.0%
	Unmarried	Count	18	47	65
		%	27.7%	72.3%	100.0%
Total		Count	122	174	296
p<.05		%	41.2%	58.8%	100.0%
Drinks Alcohol	No	Count	60	36	96
		%	62.5%	37.5%	100.0%
	Yes	Count	62	138	200
		%	31.0%	69.0%	100.0%
Total		Count	122	174	296
p<.001		%	41.2%	58.8%	100.0%
Income Class	< Rs5,000 pm	Count	59	44	103
		%	57.3%	42.7%	100.0%
	Rs 5-10,000 pm	Count	38	110	148
		%	25.7%	74.3%	100.0%
	> Rs 10,000 pm	Count	25	20	45
		%	55.6%	44.4%	100.0%
Total		Count	122	174	296
p<.001		%	41.2%	58.8%	100.0%

Only 198 (66.9%) were aware of HIV transmission by shared needles among drug users. Two hundred seventy six (93.2%), 255 (86.1%) and 272 (91.9%) were aware of transmission by contaminated blood transfusion, by breast feeding and by homosexual (men having sex with men), respectively.

Misconception about HIV transmission: Sixty three (21.3%), 32 (10.8%), 30 (10.1%) and 29 (9.8%) believed mosquito bites, living in the same room, shaking hands and sharing food, respectively, will transmit HIV. Only 8 (2.7%) believed sharing tools with HIV/AIDS patient will spread HIV infection.

Knowledge about Prevention of HIV/AIDS: Two hundred eighty three (95.6%) were aware that using condom can prevent HIV transmission. Only 193 (65.2%), 147 (49.7%) and 138 (46.6%) believed avoiding contact with High Risk Group (HRG) individuals (prostitutes, gays, intravenous needle users, etc.), being faithful to regular partner sexually and abstinence from sex before marriage, respectively, could prevent HIV/AIDS. Two hundred

eighty one (94.9%) believed use of disposable syringes can prevent HIV transmission.

HIV Prone behaviour of Truck Drivers: Unmarried drivers, those who drank alcohol, those who stayed away from home for less than 15 days and middle income drivers were significantly more likely to visit CSW (Table 1). Association of Condom use and visit to CSW can be seen in Table 2. The difference was statistically significant (p<.001). Those visiting CSW did not use condoms due to non availability (35.7%), uneasy feeling during intercourse (35.7%), did not feel it necessary (14.3%), etc. Out of those not visiting the CSW the reason for not using a condom were uneasy feeling during intercourse (38.2%), did not feel it necessary (21.1%), partner was sterilized (14.5%), not available (7.9%), using Copper T (2.6%), using *coitus interruptus* (1.3%), already pregnant (1.3%), and trying to have a baby (1.3%).

Table 2 CSW visit and Condom Use

		Uses Condom		
		No	Yes	Total
Visits CSW	No N (%)	76 62.3	46 37.7	122 100
	Yes N (%)	28 16.1	146 83.9	174 100
Total p<.001		104 35.1	192 64.9	296 100

One hundred thirty five (45.6%) were not exposed to CSW in the last 3 months and 38 (12.8%) visited more than 5 CSW in last 3 months. 11 (3.7%) used injectable drugs but none of these shared needles with anyone else.

Discussion:

Almost all the truck drivers heard of HIV / AIDS. However, knowledge on specific mode of transmission was low, especially transmission by sharing needles.

Use of injectable drugs is not a public health problem in truck drivers in North India, especially as none of the users were found to share needles.Unlike Chaturvedi et al[4], we found knowledge of transmission by breast feeding and homosexual route was high among truck drivers. We also did not find any association with educational status. We found the misconception about mosquito bite and sharing meals to be 21.3% and 9.8% as compared to 53% and 26.5% reported. This clearly shows that knowledge is getting better and misconceptions are decreasing with time or different knowledge and misconceptions in North India as compared to South Western India where previous study was conducted. Unlike them we found significant association between marital status and visit to CSW. Like Chaturvedi et al[4], we also found significant association between alcohol drinking and visit to CSW. Two hundred (67.6%) drivers drank alcohol. High alcohol consumption (60%) has also been reported by Manjunath[5]. Contrary to previous studies, we found that drivers who been on the road for over 15 days in a month are less likely to be exposed to CSW as compared to drivers who were on the road for less than 15 days in a month. Contrary to some studies we found the condom use in those visiting CSW to be 83.9%. Ahmed SI in 1992 reported 82% CSW exposure and none of them had used a condom[6]. Mishra in 1998 found 80% of truck drivers visited CSW and of these 75% did not use a condom or used it very irregularly[7]. This clearly shows a pattern of decreasing CSW visit and more frequent use of condom by the truck drivers. But still 14.3 % of truck drivers visiting a CSW do not feel condom use to be necessary; this can only change with better education.

Recommendations

Easy availability of condoms in rural areas has to be ensured. It is difficult to get condoms outside the city limits and is the main reason truck drivers visiting CSW do not use a condom. More education for safe sex among the truck drivers is needed so that they understand the importance of using condoms when visiting CSWs.

Limitations of the study- Due to cross-sectional nature of the study, change in behaviour among the truck driver over time, reasons for the same, effects of experience, changes like marriage etc. could not be documented and analysed. Even though long distance truck drivers are not dependent on their routine by the day of the week, some bias may have crept in due to study being conducted only on Sundays.

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SHORT ARTICLE - 2

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Sharing an Experience of Social Mapping Exercise at Peri-urban Area of Puducherry

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Date of Submission: 18.03.2012 Date of Acceptance: 31.03.2012

Abstract:

Social mapping is undertaken as a part of community based participatory research, when researchers are new to the local community to establish comfortable forum for discussion and participatory planning of project activities. The present article focuses on the process adopted and lessons learned while doing social mapping at our new peri-urban field practice area. The mapping was done in Thirukkanur, a peri-urban village of Pondicherry (renamed as Puducherry), a union territory of India. The social mapping exercise was facilitated by the social scientist of the department of Community Medicine. A faculty in Community Medicine (first author) who was recently trained in principles of participatory tools, observed the entire process. On the given date and time, 29 villagers (two men and other women) assembled as 'local analyst' to reflect on issues in discussion. There were 210 houses, of which 32 were *kaccha*, 32 had tiled roof and 146 were *pacca* houses. Twenty *pacca* houses were built under government scheme called '*Kamaraj kalveadu kattum'* – a housing scheme for below poverty line people. The various health issues emerged were – 1) improper and open drainage system, 2) breeding of mosquitoes, 3) non-communicable diseases like diabetes and blood pressure were more common, 4) drinking water was reported to be 'hard' leading to problem of renal stones among local community. One of the respondents took us to her house and showed the accumulation of salt over water pipes. She said that *it is hard enough to break and we are getting kidney problems due to it,and* 5) and problem of waste disposal and stagnation of water. To, conclude social mapping made local people aware of their problems and demand services for it. It also helped us to build up rapport with the community.

Key words: Social map, Participatory technique

Introduction:

'Social mapping' is a participatory technique to show the relative location of households and distribution of social structures and institutions in a local area through active participation of local people.

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Apart from understanding of the physical characteristics of a village and collecting demographic data, social mapping is a way to build rapport with the local community. Conventionally, social mapping is undertaken as a part of community based participatory research, when researchers are new to the local community and desires to establish comfortable forum for discussion and participatory planning of project activities. The present article focuses on the process adopted and lessons learned while doing social mapping at our new peri-urban field practice area. It was done to plan our health

services and community oriented teaching activities. This exercise was an opportunity to built up rapport with the local community and understand their social structures and health problems.

Process of Social mapping at Thirukkanur:

The mapping was done during September 2010 in Thirukkanur, a peri-urban village of Pondicherry (renamed as Puducherry), a union territory of India, having population of 1,244,464.

It has literacy rate 82 percent and sex ratio of 990 per 1000 males which is above the national average. Permission from the local Councilor (local political leader) for conducting the social mapping exercise was obtained and the community members were consulted beforehand for convenient dates, time and place for meeting. The social mapping exercise was facilitated by the social scientist of the department of Community Medicine. A faculty in Community Medicine (first author) who was recently trained in principles of participatory tools, observed the entire process. On the given date and time, 29 villagers (two men and other women) assembled as 'local analyst' to reflect on issues in discussion. The meeting was held at the courtyard of one of the participants, where all other participants were willing to come and participate.

The facilitator, observer and note-taker introduced themselves and explained them the purpose of the discussion. Conventionally, the social mapping exercise is done using locally available items such as *rangoli* powder, stones, seeds and sticks etc. Since the present locality had high literacy rate, we decided to use chart paper and color pens. To begin with, participants were hesitant, and then a part-time helper to the village health nurse took a lead and took a pencil to draw map on the paper. Before drawing the map she was apprehensive that if she misses any house then she would be blamed, but other members gave confidence that they would contribute and correct when their street is drawn and by this it was made sure that no house was missed out. During the process the other members slowly got very enthusiastic and started to contribute actively. Different colored sketch pens were used to differentiate the houses like *kaccha, pacca*, and vacant plots. There was a lot of discussion among the groups before they plotted the houses. The map was completed by drawing the roads, different types of houses, sources of water, shops, school, etc. After the completion of the map, we probed into various issues like, common health problems, source of drinking water, type of occupation, nearby health center, education at school, houses built under government scheme. The participants were requested to help to identify the different types of houses, different caste group, families which availed loan for construction of houses, antenatal mothers, under-five children's, etc. The final social map was shown to all the members and everyone in the group agreed to it. As a token of appreciation refreshment were served after the mapping and we thanked them for their active participation. The whole process took three long hours. It was followed by a transect walk in the village.

Findings:

There were 210 houses, of which 32 were *kaccha*, 32 had tiled roof and 146 were *pacca* houses. Twenty *pacca* houses were built under government scheme called '*Kamaraj kalveadu kattum'* – a housing scheme for below poverty line people. The local community was employed in local factories, government services, and non-organized sectors such as laborers in agriculture and other sectors.

There was one Primary Health Centre and our health centre in the locality. One of the participant said that *they want specialty health care for conditions such as diabetes, blood pressure and eye problems.* There were two government schools and two private schools. There was one water tank in the locality. All houses had individual piped water supply and power supply. It was under *Mannadipet panchayat* (local self-government).

The various health issues emerged were – 1) improper and open drainage system, 2) breeding of mosquitoes, 3) non-communicable diseases like

diabetes and blood pressure were more common, 4) drinking water was reported to be 'hard' leading to problem of renal stones among local community. One of the respondents took us to her house and showed the accumulation of salt over water pipes. She said that *it is hard enough to break and we are getting kidney problems due to it,* and 5) problem of waste disposal and stagnation of water.

Lessons learned:

Time

Before planning the activity it is important to know the leisure time of the people. We carried out social mapping during the day, because of this, representation from other groups like men, youth, and adolescent were very minimal. It is better to do daily activity charting with local people to know their free time and plan meeting at a time and place convenient to them. Equally there could be benefits in working with mixed groups to ensure debate and discussion. Being a peri-urban area the occupation of the people varies widely, selection of right time was very difficult. Additionally if we seek the participation from all groups, selection of right time for the study becomes very important so that men and women of all age groups could be available.

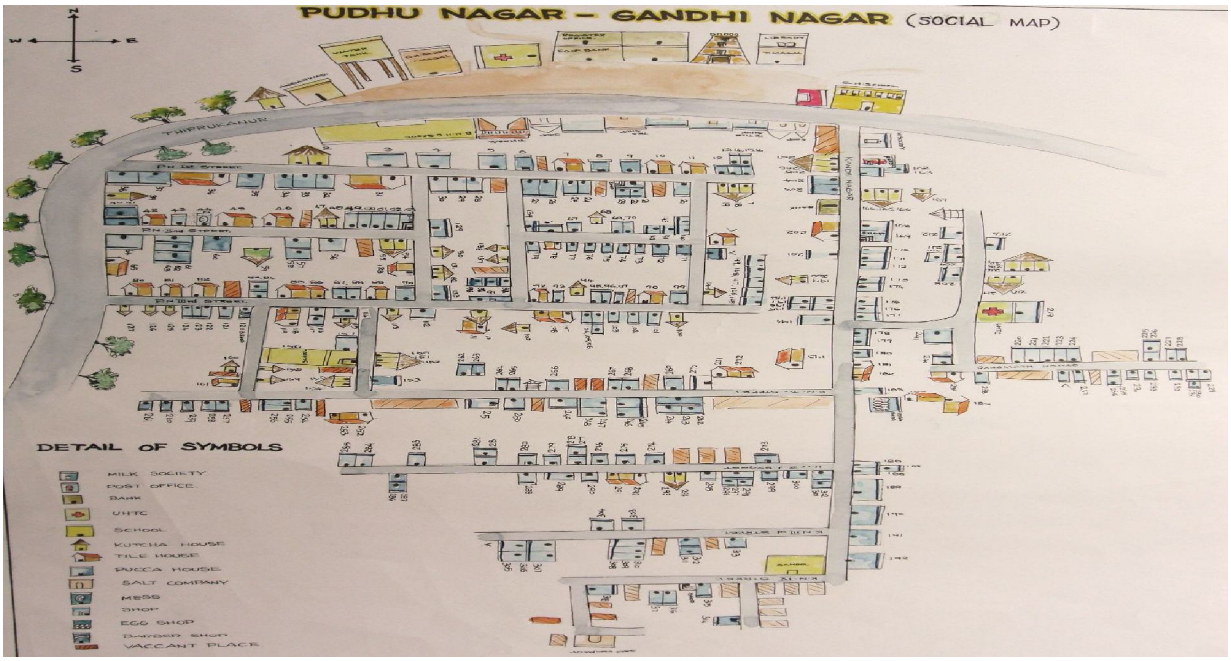
Selecting the place for mapping exercise

It is desirable to consult the community members for a convenient location, place where the map is to be made holds a lot of relevance. The location should be such that people of all castes, class and gender can gather and create an environment where participants are able to take initiative without any hesitation. It should be mutually agreeable, accessible, and spacious enough to accommodate all people who are drawing and contributing to the map. In our case the people themselves chose the house of one of the community member as a location for the mapping exercise.

Selecting Materials for map

Drawing the map on the ground has its advantages like no lack of boundaries, larger size, increased potential for participation, as well as great ability to make corrections, besides as map can be prepared using locally available materials, even illiterate people can actively participate. In our case for drawing the map, the group preferred to use paper, pencil and sketch pens. Ideally map should be drawn on the ground using locally available materials such as stones, leaves, *rangoli* powder etc, but in our case

Figure 1



the map was drawn on a sheet of paper and so the documentation was easy, one of community member volunteered to make a copy of map using color sketch on a chart paper. After the process of triangulation the artist of our department sketched the final map.

Starting the map

It is difficult to get started particularly as this is often the first visual tool used and participants may lack confidence for fear of being ridiculed by others and the belief that maps are only made by experts. We felt that a good way of getting them to start is by offering refreshments, so that they were more comfortable and got familiar with the surroundings. We gave the option for selecting the materials for preparing the map. As the community members were literate they opted to draw the map using paper, pencil and sketch pens.

Conclusion:

Social mapping was found to be a good way to understand the nature of infrastructure and local health problems. It also made local people aware of their problems and demand services for it. It also helped us to build up rapport with the community.

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Assessment of Knowledge on Health Economics among Medical Professionals in Chennai

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Abstract

Objectives: To measure the level of knowledge of medical professionals on health economics in Chennai. **Materials and methods:** A cross sectional study was conducted in two randomly selected medical colleges in Chennai using a self administered questionnaire. The first part of the question contained respondent's general information (age, sex, institution, designation and year of experience etc). The second part of the questionnaire was in multiple closed choice formats with focus from general knowledge of health economics to specific terms related to health economics. **Results:** 189 doctors who were all present on the date of visit to the colleges and who were willing to participate in the study were included. 73.5% of the doctors said they have heard of the term health economics, but of them only 43.9% said they are familiar with the term health economics. The assessment showed the overall knowledge was poor with lowest score for cost benefit analysis at 12.7% and highest for marginal cost at 59%. None of them are regular readers of articles related to health economics while 39.7% did not read at all. Only 6.3% of doctors used regularly the technique of health economics in their clinical practice while 40.8% did not use them. 92.8% of the doctors felt that subject of health economics should be included in undergraduate, postgraduate or both the curriculum. **Conclusion:** The outcome of this study has revealed that the knowledge level of doctors in day to day use of health economic concepts was limited. Providing doctors with basic health economics knowledge at various levels of their medical education and training will go a long way in improving their basic knowledge in health economics concepts.

Key words: health economics, medical professionals, level of knowledge.

Introduction

Economic evaluation is now an accepted tool for the appraisal of any health care programs, effectiveness of medical and surgical interventions and need to optimize the use of scarce medical resources to meet the health needs. Medical profession should know how to measure the cost of interventions and how to measure their benefits. Clinicians often face decisions about cost and efficiency of medicine and technologies that aggregate impact on the health system.[1],[2] The terminology of health economics has invaded the field of health and gradually begin to share standard language in clinical practice.[3],[4],[5] On the other hand, in the medical literature national and international source of information for the physician, is increasingly using references and terms related to the principles and applications of health economics. Likewise, the literature of general medicine and specialties has increased significantly the number of articles with the

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economic approach.[6],[7] Doctors are the main actors involved in the structure and performance of the health care system of a country, since they are major part of the team that required achieving the goals of the plan's health.[8] Given the importance of health economics and rise in recent decades, doctors should have basic knowledge about it and actively implement in diagnostic decision making, therapeutic interventions, the prevention programs, epidemiology and research. The objective of this study was to measure the level of knowledge of medical professionals on the general topic of health economics in two medical colleges in Chennai.

Materials and methods

A cross sectional study was conducted in two purposively selected private medical colleges in the suburbs of Chennai. Self administered questionnaire was used to collect the data from doctors who were willing to participate in the study on the date of visit to the medical college. The first part of the question contained respondent's general information (age, sex, institution, designation and year of experience etc).The second part of the questionnaire was in multiple closed choice format with focus from general knowledge of health economics to specific terms related to health economics and the respondents were asked to identify direct cost, indirect cost, marginal cost and basic definitions of health economics such as opportunity cost, cost benefit, cost effectiveness, cost effective ratio, cost utility, efficiency, etc. The questionnaire was designed based on different texts of general economic health.[9],[10].[11] A pilot study was conducted to evaluate the clarity and comprehensiveness of the questionnaire. The data was analyzed with the help of Microsoft excel and SPSS software. The average score for general knowledge on health economics and specific terms related health economics was calculated. All the survey questions related to basic definitions on concepts of health economics were assigned equal value, ie 1 for correct response and 0 otherwise. For calculating the overall rating scale the total number of correct response was divided by the total number of questions and multiplied by 10. The score 10 corresponds to those who have obtained all 13 correct response on the basic concept of health economics. Score of zero corresponds to those who have incorrect responses in all 13 questions. A score of 5.38 corresponds to 7 correct responses out of 13 questions.

Results

The study was conducted among two randomly selected private medical colleges in the suburb of Chennai. 189 doctors who were all present on the date of visit to the colleges and who were willing to participate in the study were included. 36% of the participants were females and 64% of them were males. The age range was from 20 to 65 years. 79.4% of the participants were in the age group of 20-39. Table 1 shows the qualification and years experience of doctors, majority 67.8% of them were postgraduates and 50.8% of them have less than 5 years of experience and nearly another 50 percent of them more than 5yeras of experience.

Table1: Educational qualification & Years of Experience of Doctors

Variables	Frequency	(%)
Educational qualification		
Undergraduates	59	31.2
Postgraduate diploma	2	1.0
Post graduates	128	67.8
Total	**189**	**100.0**
Years of experience		
< 1 year	64	33.8
1-5 years	32	16.9
5-10 years	54	28.6
10-15 years	20	10.6
>15 years	19	10.1
Total	**189**	**100.0**

Table 2 shows that 73.5% of the doctors said they have heard of the term health economics but of them only 43.9% of them said they are familiar with the term health economics. 6.3% of doctors used regularly the techniques of health economics in their clinical practice, 24.3% have used occasionally and

28.6% have used rarely and rest 40.8% did not use techniques of health economics. Assessment of the reading habits of the doctors, none of them are regular readers of articles related to health economics. 22.2% were occasional readers, 38.1% read rarely and 39.7% did not read any articles related to health economics.

Table 2: Knowledge & practice level of doctors on health economics

Statement	Frequency	(%)
Heard of the term health economics	139	73.5
Familiar with health economic terms	83	43.9
Use of health economic techniques		
Regular users	12	6.3
Occasional users	46	24.3
Rare users	54	28.6
Do not use	77	40.8
Total	**189**	**100**
Habits of reading article on health economics		
Regular readers	Nil	Nil
Occasional readers	42	22.2
Rare readers	72	38.1
Do not read	75	39.7
Total	**189**	**100**

On the suggestion of the inclusion of the subject of health economics in medical curriculum, 28.2% has mentioned to include in undergraduate curriculum, 26.5% has mentioned to include in the post graduate curriculum and 38.1% mentioned to include both in undergraduate and postgraduate curriculum while 17.4% mentioned no need to include health economics in medical curriculum (Table.3).

The assessment of the knowledge on the basic concepts of health economics like opportunistic cost, cost benefit analysis, cost effectiveness analysis, cost utility analysis, direct cost in medical care, indirect cost in medical care and marginal cost in health care revealed the following information; The average score was 3.03 (1.24- 4.82). The mean score for male doctors were 2.90(1.11- 4.68) and for females were 3.31(1.58-5.05).

Table 3: Views of doctors on inclusion of health economics in Curriculum

Inclusion of health economics in Curriculum	Frequency	(%)
Undergraduate curriculum	53	28.0
Postgraduate curriculum	50	26.5
Both	72	38.1
None	14	7.4
Total	**189**	**100.0**

Table 4: Definitions of terms used in assessment of knowledge of health economics

Sl no	Definition	Correct responses N= 189	(%)
1	Cost benefit	24	12.7
2	Cost effective ratio	31	16.4
3	Indirect Costs	36	20.2
4	Technical efficiency	40	21.2
5	Allocative efficiency	45	25.3
6	Cost effectiveness	48	25.4
7	Utility Cost	48	25.4
8	Direct costs I	78	41.3
9	Direct cost II	81	42.9
10	Opportunity cost	93	49.2
11	Marginal cost	105	59.0
12	Recommended GNP to be spent by a country by WHO on health	109	57.7
13	GNP spent by India on health	36	19.0

Table 4 shows the assessment of knowledge on the basic concepts of health economics, 0n the assessment of knowledge on opportunist cost 49.2% of the doctors were correct in their response, knowledge on cost benefit analysis 12.7% of them were correct, knowledge on cost effective analysis 25.4% of them were correct, knowledge on cost effectiveness ratio 16.4% of them were correct, knowledge on cost utility analysis 25.4% of them were correct, knowledge on allocative efficiency 25.3% of them were correct, knowledge on technical efficiency 21.2% of them were correct, knowledge on indirect cost 20.2% of them were correct, knowledge regarding direct cost 41.3% of them were correct and knowledge on marginal cost 59% of them were correct. Knowledge on the World Health Organization recommendation regarding the amount of GNP that has to be spent on health sector by a country, 57.7% of the doctors were correct in their response, and in knowledge regarding the amount of GNP spent by India in health care 19% of them gave correct answers.

Discussion

The present study revealed that out of 189 doctors participated in the study two third (64%) of them were males and more than three fourth (79.4%) of the doctors were in the age group of 20-39 years. The mean knowledge score was 3.03 (1.24- 4.82) in the range of 0 to 10 scale and no difference in the knowledge level between male and female doctors. Similar findings were reported in a study done on medical doctors in Mexico were the mean knowledge score was 4.1 +/- 2.1 (0 to 10 scale), for physicians and the average score for men was 4.1 and for women was 3.9. [12]

Even though three fourth of the doctors said they have heard of the term health economics only half of them said they were familiar with the term health economics. Only 6.3% of doctors used regularly the technique of health economics in their clinical practice. In a study conducted in Mexico has reported that 17% of the physicians read materials on health economics regularly. [12] While another study reported that 42% of the physicians reported high levels of cost consciousness in their daily practice. [13] Vito CD reported that the professional use of the economic evaluations of the health interventions in clinical practice is quite low among Italy physicians. [14] Jeannette E.F reported that only a third of respondents across all of the countries under European EUROMET project stated that they had ever actually used an economic evaluation study. The actual use of economic evaluation, and knowledge about it, are still limited. These observations correspond with findings in other European countries. [8] In a study among academicians, practitioners, and community representatives that more than half of the respondents reported very little or no current use of health economics in their work.[15] In our study 16.4% and 25.4% of the doctors had knowledge on the cost effectiveness ratio and cost effectiveness analysis. The Italian study reported that although many physicians show a positive attitude toward cost-minimization and, to a lesser extent, to cost-effectiveness analysis, they rated their methodological knowledge as unsatisfactory. [14]

The questions regarding knowledge on the World Health Organization recommendation on the amount of GNP that has to be spent on health sector by a country shows that 57.7% of the doctors were correct in their response, but it was only 11% as reported by the Mexican study.[12] The assessment of knowledge on the basic concepts of health economics showed the overall knowledge was poor with lowest score for cost benefit analysis (12.7%) and highest for marginal cost 59%, in contrast the Mexican study [12] has reported that lowest score was for opportunistic cost (22%) and highest score for direct cost (82%). The assessment of knowledge in both cost effectiveness analysis (CEA) and cost utility analysis (CUA) showed that 25.4% of the doctors were correct in their response. In the study among the physicians in Netherlands showed that they did not know enough about the differences between a CEA and a CUA to state the advantages and disadvantages of these methods.[8] The knowledge on basic concepts on health economics and their usage by medical professional in our study were limited.

Similar findings were reported by other investigators. [16], [17], [18].

The study was carried out on two purposively selected private medical colleges in Chennai, which allowed us to evaluate the knowledge of doctors who were of easy accessible. Future research has to be carried out on large scale involving private practitioners practicing in their clinics, polyclinics, nursing homes and corporate hospitals and practitioners of government hospitals at primary, secondary and tertiary care levels which will give more valid results on the level of knowledge of doctors on health economics.

Conclusion:

The outcome of this study has revealed that the knowledge level of doctors in day to day use of health economic concepts were limited. Providing doctors with basic health economics knowledge at various levels of their medical education and training will go a long way in improving their basic knowledge in health economics concepts. Increasing the awareness among medical professional on the economic evaluation approach will improve their usage in their decision making.

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Factors Affecting the Snake Bite and Health Seeking Behavior of Snake Bitten Individuals of Madurai District, Tamilnadu.

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Abstract:

Objectives: To find out the factors affecting the snake bite and health seeking behaviour. **Materials and Methods:** A cross sectional study was designed; the study sample was selected by the purposive non probability sampling method, those who were admitted with snake bite between December 2009 to August 2011 in the Department of Medicine, Government Rajaji Hospital, Madurai, were included in the study. **Results**: Most of the snake bites occurred in males 102 (66.6%). Only 51(33.3%) snake bite occurred in females. Among the males maximum incidence occurred in the age group of 31-40 years. Though the snake bite incidence occurred in all castes, majority of the incidences were observed in Scheduled caste (SC) 48 (31.4%) followed by Scheduled Tribe (ST) 45 (29.4%). Maximum incidence of snake bite was found between 6-9 PM (32.0%) followed by 6-9 AM (15.6%). **Conclusions**: About 90% of poisonous snake bites are hematotoxic, and mean distance from the site of bite to tertiary care facility was 37 Km. More than 90% of the bites are on the feet while venturing into the wilderness.

Keywords: Snake bite, Health seeking behavior, Madurai.

Introduction:

Snake bite is one of the major public health problems in the tropics. It is also emerging as an occupational disease of agricultural workers. In view of their strong beliefs and many associated myths, people resort to magico-religious treatment for snake bite; thus, causing delay in seeking proper treatment and loose time in some cases that might have been treated successfully. Many deaths occur before they reach the hospital. India alone contributes to 81,000 envenomations and11,000 deaths annually.[1]

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According to another study 45,900 annual snakebite deaths nationally (99% CI, 40,900 to 50,900).[2] In Tamil Nadu the total number of snake bite cases admitted in the secondary care hospitals during 2005-06 and 2006-07 were 19,321 and 20,677 out of which 85 and 75, respectively died.[3] About 10% of snakebite deaths are among the victims who come to the hospital and 90% die outside, having gone for other remedies like indigenous medicine (roots) and fasting.[1,4] This present study will give a clear picture of Socio-demographic distribution and their health seeking behaviour, in availing different modalities of treatment among the people of Madurai district in Tamilnadu state.

Methodology

A cross sectional study design was planned to conduct the study on socio-demographic distribution and health care seeking behavior of snake bite victims. The study sample was selected by the

purposive non probability sampling method, those who were admitted with snake bite in the Department of Medicine, Government Rajaji Hospital, Madurai between December 2009 to August 2011. Patients who got discharged against medical advice were excluded from the study. From this selected study sample the data was collected with pretested personal interview questionnaire. We have used BG Prasad socio-economic classification for this study.

Results:

The snake bite victims were distributed with mean age of 42.9 years and a male: female ratio of 2. The distribution of snake bite victims based on age and sex can be seen in Table 1.

Tab1e 1 - Distribution of snake bite victims based on age and sex

Age	Sex		Total
	Male	Female	
11-20	5 (4.9%)	3 (5.9%)	8 (5.2%)
21-30	11(10.8%)	10 (19.6%)	21 (13.7%)
31-40	28 (27.4%)	13 (25.4%)	41 (26.8%)
41-50	25 (24.5%)	8 (15.6%)	33 (21.5%)
51-60	17 (16.6%)	8 (15.6%)	25 (16.3%)
61-65	14 (13.7%)	9 (17.6%)	23 (15.0%)
66+	2 (1.9%)	0 (0.0%)	2 (1.3%)
Total	102 (100%)	51(100%)	153 (100%)

The χ^2 value is 10.4 at 6 degree of freedom p=0.14 Not Significant.

Though the snake bite incidence occurred in all castes, the majority of the incidences were observed in Scheduled caste (SC) 48 (31.4%) followed by Scheduled Tribe (ST) 45 (29.4%), Backward Caste (BC) 39 (25.4%) and least incidences in Open Category (OC) 21 (13.7%). Among the religion most of the victims were Hindus 74 (48.3%) followed by Christians 48 (31.3%), Muslims 30 (19.6%) and other religion 1 (0.6%). The majority of the snake bite victims belong to socio-economic class III, 69 (45.1%) and class IV, 58 (37.9%). Others were class II and I had 16 (10.5%) and 10 (6.5%) bites only. The study showed that 104 (68%) of the bites occurred in the farming community, and the remaining 49 (32%) in members other occupations. The snake bite incidence was varied with season. In this study we found that the peak of the incidences in the winter (November to February), 66 (43.1%); followed by summer (March to June), 49 (32.0%) and rainy season (July to October), 38 (24.8%). Majority of the snake bites were noted on the left foot, 57 (38%) followed by right foot 47 (30.7%).

It was found that there were three peak times, maximum incidence of snake bites was found between 6-9pm (32.0%) followed by 6-9am (15.6%) and 12-3pm (15.0%) as seen in Table 2.

Table 2- Bite Site to Hospital Distance

Distance (Kms)	Number of cases	Percent
<25	69	45.0%
26-50	45	29.4
51-75	7	4.5%
76-100	7	4.5%
>100	25	16.3%
Total	153	100%

At 95% confidence interval (CI): 0.134

The study showed that the mean distance travelled by patients to reach the hospital was 37.61 Km, with the median being 30 Km. The average bite to antivenom injection time (Bite to needle time) was 6.9 hours and median time until admission was 5 h 35 min (range: 2-16.35 h). The median time for consultation by Traditional Healers (TH) was 25 min (range 5-50 min). Out of 153 snake bite cases 8 cases died during treatment. Out of the eight (8) mortalities six (75.0%) visited TH and remaining two (15.0%) were due to delay of transportation. TH consultation

was associated with bite-to-hospital admission delays of more than 6 hours [relative risk: 3.0, at 95% confidence interval (CI): 1.29-3.13, P < 0.001].

Table 3 - Treatment Seeking Behaviour

Type of treatment given before brining patient to tertiary care hospital	Number of Victims			%
	Male	Female	Total	
Traditional healer	15	22	37	24.1%
Tourniquet	76	21	97	63.3%
Not given any medication	11	8	19	12.4%
Immobilization	0	0	0	0.0%
Total	102	51	153	100.0%

χ^2 value = 18.55, p value = <0.0001 significant, hence more females are going to Traditional Healer as compared to males and Health seeking behavior between male and female was statistically significant different was present.

Table: 4 Distribution of snake bite victims according to vials of Anti Snake Venom administered

Number of ASV Vials	Number of Persons			
	Persons Attended by TH		Not attended by TH	
	No	%	No	%
1-5	1	2.7	20	17.1%
6-10	5	13.5	44	38.0%
11-15	9	24.3	28	24.0%
16-20	10	27.0	15	13.2%
21-25	7	18.9	5	3.9%
26+	5	13.5	4	3.9%
Total	37	100	116	100.0%

At 95% confidence interval (CI): 0.33-0.88, x^2= 25.41; P = 0.001 Significant difference in the requirement of higher doses of ASV between attended by TH and not attended by TH.

Discussion:

The maximum incidence of snake bite occurred in the age group of 31-40 years, 41 (26.7%). In a similar study in Jammu[5], Pondicherry[6], Delhi[7] and by Sawai *et al*[8] the maximum incidences were in the age group of 21-30, 15-60, 10-30, and 10-30 years respectively. By definition the able-bodied and working people are victims of this disease and it leads to loss of productive work force, leaving their families to loose their earning member.

We found that the male female ratio of snake bite victims was 2:1. A study in Tanzania found the ratio to be 1.4:1;[9] another study in Andhra Pradesh found the ratio to be 3:1.[10] The preponderance of male victims suggests a special risk of outdoor activity especially to males who must attend to agriculture field at night time. As found in studies conducted at Pondicherry and New Delhi, the present study also shows that the incidence of snakebite is more in people employed in agriculture industry (68% in present study) compared to other occupations. This study observed that most of the bites occurred in the evening between 6-9 PM and early morning 6-8 AM; study in Tanzania has similar findings. But this study finds most bites occur in winter season and Tanzania study has found the peak to be rainy season. The present study showed hemotoxic (viperidae) snake contributing to 138 (90.1%) bites where as in Tanzania the snake was identified as the puff adder (Bitis arietans), caused most bites, 24 (28.2%).[9] The study showed that mean distance travelled by patients to reach the hospital was 37.61Km with the median being 30Km and the average bite to needle time was 6.9 hours with a median time of 5.5 hours. In other similar studies, the snakebite cases travelled a mean of 82 km (range=2-550 km) to reach the clinic.[9] in other study the median time until admission was 7 h 15 min. The median time until Traditional Healer consultation was 25 minutes for this study as compared to 15 min by others.[11-13] Since 24% of victims are going to traditional healers within 25 minutes of snake bite, we need to train the traditional healers in first aid and referral for the snake bite victims. Out of the eight (8) mortalities six (75.0%) visited TH and remaining two (15.0%) were

due to delay of transportation. Also, the requirements of Anti-snake Venom doses also were more in those who attended the TH. Similar study conducted in Hlabisa, KwaZulu Natal found similar results.[11]

Conclusion:

Snake bite is a major cause for morbidity, mortality with significant loss of earning among rural population. Individuals are usually bitten between 6-9 PM with more than 90% of the bites on the feet while venturing outside the home. About 24% of snake bite victims were consulted by TH within 25 min of snakebite (range 5-50 min). The people and TH also need to be educated for calling the statewide free ambulance service quickly to reduce the Bite of Needle time; TH need to be trained in first-aid and referral. More aggressive target population oriented education program about snake bite & first aid, promoting simple preventive measures like using boots while working outdoor is needed.

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ORIGINAL RESEARCH ARTICLE

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Cardiovascular Disease Risk Factors in a Tribal Population of Nilgiris

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Abstract

Introduction Cardiovascular diseases are the leading cause of mortality in both developing and developed countries alike. This study aimed to assess the prevalence of cardiovascular disease risk factors among a particular tribal group in Nilgiris. **Methods:** A tribal village with a population of 150 was selected and all individuals above 25 years were included in the study. A validated questionnaire modified from the WHO STEPS approach was administered for all the consenting individuals. In all there were 55 individuals who consented. A fasting blood glucose level, lipid profile, ECG and Paraoxonase 1 activity was measured. **Results:** There were 18 (32.7%) individuals with overweight as per the WHO BMI cut off (>25 kg/m^2) and 3 (5.5%) were obese (BMI>30Kg/m^2). A significant number were found to have morbidities such as Diabetes Mellitus, Hypertension, Stroke and Cardiovascular disease (21(38.2%), 8(14.5%), 7 (12.7%), 14(25.5%) respectively. Most of them reported a moderate physical activity (41.8%). About 43(78.1%) reported atleast one form of stress (either related to family, finance or health).Dyslipidemia was found very commonly. Total cholesterol was high in 7 (21.2%) of them. High triglycerides were seen in 5 (15.2%), and a high LDL was seen in only one. However, 14 (42.2%) had borderline high LDL values. The HDL values were low <40 mg/dl in 29(87.9%) of them. The PON1 activity was also abnormal in 19 (57.6%) of the 33 individuals. **Conclusion:** These results reveal that the epidemic scourge of cardiovascular disease is escalating in the tribal population as well and underscores a need for an immediate health assessment with reference to these diseases and implement a comprehensive health program in these underserved areas.

Key words: Tribes, Cardiovascular risk, Diabetes Mellitus

Introduction

Cardiovascular diseases are predicted to be the major cause of mortality and morbidity globally including India by the year 2020. In large part, this increase can be explained on the basis of major ongoing socio-demographic changes in developing countries, and associated effects on the numbers of individuals at risk and the levels of cardiovascular risk factors. Developing countries now experience a much greater burden of cardiovascular disease than do developed countries. In addition, developing countries are expected to experience the greatest rise in cardiovascular disease burden over the next few years.[1]

The cause for this increase of cardiovascular disease and atherosclerotic coronary heart disease (CHD) in developing countries has been described as epidemiological transition, a term initially suggested by Omran.[2] At any given time different countries of the world and even parts within a country are in

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different phases of this transition. Accordingly, tribal to rural to urban transition is associated with escalating sedentary lifestyle, and increased intake of calories, fats and salt; this is associated with increase in body-mass index, hypertension and coronary heart disease. The final stage is characterized by improving lifestyles and decline in cardiovascular diseases.[3]

The 'tribal' or 'indigenous people constitute around 8.08% of the total Indian population .Around 636 schedule tribe categories live in geographically scattered areas and in areas which are not easily accessible. Even though they have a rich culture they are socio-economically disadvantaged and marginalized. Facility surveys have found that infrastructure at Sub-Centres are lacking in the tribal areas. More than half of the world's tribal populations live in India. Tribes are socially weak and economically poor communities. The environment, in which they inhabit, is different from that of main land. As a result, gaping disparities in health status of tribals, when compared to metropolitan areas, are evident.

Genetic abnormalities and infectious diseases such as sickle-cell anemia, malaria, tuberculosis, leprosy, typhoid and cholera are rampant in the tribal's living in Madhya Pradesh, Maharashtra, Tamil Nadu, Orissa, and Assam states. Additionally, malnutrition, birth disorders, and gastrointestinal diseases are pervasive among tribal populations.Though many diseases such as anaemia, malnutrition and genetic diseases have been studied, no study exists on the cardiovascular disease profile in these populations. One study from Orissa by Kusuma and Das studied the prevalence of hypertension among rural, tribal and urban population. They found that 24.8% of the males and 13.4% of females were found to be hypertensives.[4]Another study by Manimunda et al on Andaman and Nicobar tribes showed the prevalence of hypertension to be 50.5 % [5]

Studies carried out worldwide, on indigenous tribes who are in the process of acculturation whether it may be American Indians, tribes of Malaysia, South America or Africa, has shown the prevalence of hypertension in the range of 10-35 per cent[6-9]. In India, there is no composite estimate on prevalence of hypertension among indigenous tribes, but the increasing prevalence of hypertension across the time among tribes has been observed by independent researchers. Isolated studies carried out in these populations like among Lepchas of Sikkim Himalayas, tribes of Andhra Pradesh, Gujarat, and Orissa have documented the hypertension prevalence in the range of 15 to 42 per cent[10-13].This study attempts to explore the presence of conventional risk factors for cardiovascular diseases which are present in the general population. In addition to the diet, physical activity, stress, diabetes mellitus, hypertension, family history, we also studied the Paraoxonase 1 activity which is most commonly associated with coronary artery disease risk in the general population.[15]

Identification of CVD risk factors among tribals will help the policy makers to design and deliver better programs for prevention and treatment of these diseases. In addition, creating awareness about the harmful consequences of these diseases and how to prevent them would help in halting the incidence before it rises.

Materials and Methods

Study Population and Research Design

The study was approved by the Institutional Human Ethics Committee and a written informed consent was obtained from all the study volunteers.

A tribal settlement which is about 30 km from Kotagiri in the Nilgiris was selected for the first phase of the study with the help of the Nilgiris Adivasi Welfare Association (NAWA), the results of which are presented in this paper. The tribal settlement has a population of around 150 and all individuals who were above 25 years were included in the study. The study team comprised of a community medicine physician, a general physician and a cardiologist. A medical doctor from the mobile outreach clinic of the Government facility at Kotagiri and a field worker who belonged to the study village accompanied the study team. The villagers were notified about the study ahead of the visit.

Anthropometric and Blood pressure Measurements

A medical camp was organised on the day of data collection. House to house information was given

and 55 individuals consented to participate in the study. They all belonged to the Irula tribe. After obtaining informed consent, using a questionnaire modified from the WHO STEPS approach [14], demographic details and other details about the diet, physical activity, morbidity pattern and family history were collected. Anthropometric measurements were taken as per the WHO recommendations[14] along with an electrocardiogram (ECG). Blood pressure was measured using the mercury sphygmomanometer. Two readings at ten minute intervals were measured and the average value of both the readings were taken for the study purpose. All the subjects were asked to return the next morning after overnight fasting.

Blood Chemistry

Of the 55 individuals who attended the camp only 33 consented for withdrawal of blood for fasting blood sugar and lipid profiles. Samples were centrifuged at the camp site and transported to the lab facility on the same day for processing. In addition to these investigations, the quality of HDL was also measured using the Paraoxonase 1 activity (PON1) In addition to the low HDL values, few studies have indicated the need to check the quality of HDL rather than the quantity. Hence the indirect measure of the HDL activity was also assessed using the Paraoxonase 1 activity (PON1) Paraoxonase is a mammalian enzyme associated with high-density lipoprotein in serum. Low serum Paraoxonase levels are positively correlated with risk of cardiovascular disease.[15]

Statistical Analysis

Statistical analysis was done using SPSS version 19 (SPSS Inc, IL Chicago).descriptive statistics was used to calculate the mean and standard deviation.

Results

The initial responders for the questionnaire were 55 in number. There were 12(21.8%) males and 43(78.2%) females. The participants were from the age range 22 to 75 years, 21 (38.2%) were between 20-40 years, 41.8% were between 41-60 years and 20% were above 61 years. Most of them were agricultural workers with more than half of them with an income ranging from 1000-3000 per month. About 19(34 %) had completed secondary schooling and 17(30.9%) of them had attended primary school, 16(29%) were illiterates and there were 2 (3.6%) graduates. The baseline anthropometric measurements are presented in Table 1.

Table 1 Demographic and anthropometric characteristics of the study population

Variable	Male (n=12)	Female (n=43)	Total (n=55)
Age	54.16 (+/-15.25)	47.16 (+/-14.66)	48.69 (+/-14.9)
Height	159.66 (+/-8.20)	147.55 (+/-5.6)	150.20 (+/-8.01)
Weight	61.13 (+/-15.11)	54.51 (+/-10.24)	55.95 (+/-11.65)
Hip circumference	92.62 (+/-8.63)	93.30 (+/-8.85)	93.15 (+/-8.72)
Waist Circumference	87.33 (+/-9.96)	81.58 (+/-11.11)	82.83 (+/-11.04)
Body Mass Index	23.64 (+/-3.59)	24.95 (+/-4.06)	24.67 (+/-3.97)

Table 2: Cardiovascular Disease Risk Factors in the study population

Risk Factor	Number (%)
Tobacco consumption	7(12.7)
Alcohol Consumption	
Present	4(7.3)
Past (stopped atleast for a year)	8(14.5)*
Added salt diet	21(38.2)
Diabetes Mellitus	21(38.2)
Hypertension	8(14.5)
Cardiovascular disease	14(25.5)
Stroke	7(12.7)
Physical Activity	
Very Light	8 (14.5)
Light	15(27.3)
Moderate	23(41.8)
Heavy	9(16.4)
Stress	43(78.1)
Waist circumference (Male >102cm,female 88cm)	14(32.6)
Waist Hip Ratio (Male>/=0.9,Female >/=0.8)	40 (72.7)
Overweight (BMI>25kg/m^2)	18(32.7)
Obese (BMI> 30kg/m^2)	3(5.5)

**Among the 8 there were 3 women*

Consumption of tobacco in any form was present in 7 males (12.7%) and 4 (7.3%) consume alcohol presently. Totally 8 of the respondents (14.5%) 5 males and 3 females gave a past history of consuming alcohol and stopped atleast for a year. Though the dietary history did not reveal any high calorie diet, 21(38.2%) reported of added salt diet. Other morbidities such as Diabetes Mellitus, Hypertension, Stroke and Cardiovascular disease were present in a significant percentage of the population (21(38.2%), 8(14.5%), 7 (12.7%), 14(25.5%) respectively. Most of them reported a moderate physical activity (41.8%). About 43(78.1%) reported atleast one form of stress (either related to family, finance or health).Presence of a high waist circumference was seen in 14 of them (32.6%) and a high Waist Hip Ratio was seen in 40(72.7%) of the study population. There were 18 (32.7%) individuals with overweight as per the WHO BMI cut off (>25 kg/m^2) and 3 (5.5%) were obese (BMI>30Kg/m^2). (Table 2)

Table 3: Blood Sugar, Lipid Profile and PON1 activity of the study population (n=33)

Investigation	Number (%)
Fasting Blood Sugar	
<100 mg/dl	24(72.7)
100-126 mg/dl	6(18.8)
>126 mg/dl	3(9.09)
Total Cholesterol	
Normal <200mg/dl	26(78.8)
High >200mg/dl	7(21.2)
Triglycerides	
Normal <150mg/dl	20(60.6)
Borderline High 150-200mg/dl	8(24.2)
High >200mg/dl	5(15.2)
Low Density Lipoprotein	
Normal < 130mg/dl	18(54.5)
Borderline High 130-160 mg/dl	14(42.4)
High >160mg/dl	1(3)
High Density Lipoprotein	
<40 mg/dl	29 (87.9)
>40 mg/dl	4 (12.1)
PON 1 activity	
Normal	14 (42.4)
Reduced	19(57.6)

Blood was drawn after an overnight fasting. Only 33 of the 55 respondents consented for blood withdrawal. The results are shown in Table 3. Though there were 21 known diabetics, three of them had a blood sugar more than 200 mg/dl who were possibly diabetics. In addition to the 21 self reported diabetics who were on treatment, 3 more were found to be diabetics making the prevalence 24 (43%). Similarly, in addition to those who reported to be hypertensives receiving treatment, 2 of them were found to have a blood pressure of more than 150/100 mm of Hg on two readings during the initial assessment. Dyslipidemia was found very commonly. Total cholesterol was high in 7 (21.2%) of them. High triglycerides were seen in 5 (15.2%), and a high LDL was seen in only one. However, 14 (42.2%) had borderline high LDL values. The HDL values were low <40 mg/dl in 29(87.9%) of them. The PON1 activity was also abnormal in 19 (57.6%) of the 33 individuals. In addition to these the following ECG abnormalities were identified in the study population "p" pulmonale in 3(the cause of which was not evaluated), Left Ventricular Hypertrophy secondary to systemic hypertension in 4, and evidence of old Myocardial Infarction in 5 of them.

Appropriate management and health education was provided during the camp and subsequently results were communicated to the medical officer of the tribal outreach clinic.

Discussion

The present study is the first to investigate the presence of cardiovascular risk factors among a tribal population and reveals that CVD is an important health problem in this tribal population of South India. Contrary to the notion that these risk factors are highly prevalent in the urban population, we found a high prevalence of diabetes, hypertension and Dyslipidemia with reduced HDL activity. A study by Mandani et al on hypertension among tribals showed a similar prevalence of hypertension, overweight and obesity.[16]However, they did not investigate for diabetes, lipids or ECG abnormalities. The major strength of our study is the assessment of the complete risk profile of the tribal population including the lab investigations and ECG. It is of concern to note that the conventional risk factors such as obesity, hypertension and diabetes mellitus

that are found in the urban population are also present in the native tribals who are not exposed to urbanization or obesogenic environment. As reported in other studies[15] it is important to assess the HDL quality rather than quantity as evidenced by a low PON1 activity in our study. In this context it would be worthwhile to explore the role of genetic contribution of these diseases in addition to the environmental risk factors.

Though the sample size is less, it should be worth noting that this study was carried out in one of the smaller tribal settlements and this is an ongoing study. These findings draw attention to a significant transition that has occurred in this population and it is vital to make a major impact on a leading cause of disease burden which is emerging in the tribal populations as well. Another study from Andhra Pradesh reported a low prevalence of hypertension among a primitive tribal group and a high prevalence of hypertension in an acculturating tribal population; it depicted acculturation as a cause for increased BP levels and increased prevalence of hypertension.[11]

Though in this present study we found that most of them were physically active and did not report consumption of high calorie diet, there was a high prevalence of hypertension, overweight and obesity. Though the economic differences between the urban and tribal populations seem to be wide, the prevalence in the risk factors is similar in both the groups. This supports the concept of 'shift from early adopters to late adopters' which explains that the burden of CVD shifts from the richer and better-educated sections to the poorer and less educated sections as the CVD epidemics mature and as risk behaviors shift from 'early adopters' to 'late adopters' as proposed by Howson et al. [17]

The immediate next steps would be to identify and treat secondary (metabolic) causes of CVD including hypertension, diabetes, and dyslipidemia in a larger group of population to know the exact burden of the disease. It is equally important to address issues affecting access to high-quality health care. Insurance coverage; sufficient numbers of local health care providers, including CVD specialists; transportation. Continued education among providers and in the community must be offered in a gender specific and culturally appropriate manner as also the intervention regarding primary causes of CVD, such as overnutrition (related to overweight and obesity). Information must be disseminated in various forms and by various means with respect to diversity of gender, age (young versus old), and ethnicity. Adequate health literacy is very important to motivate any behavioral modification necessary for good cardiovascular health.

This study has some limitations. A low sample size,one group of tribals alone were studied and we did not have follow up blood pressure and blood sugar readings on those who were found to have high blood pressure and blood sugar readings for the first time in the camp.

A larger study is being planned based on these findings among all the tribals of the Nilgiris to assess the burden of non communicable diseases among native tribals who form a significant proportion of the Indian population. Targeted interventions and health programs should be designed to address this emerging epidemic.

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Nutritional Status and Personal Hygiene Related Morbidities among Rural School Children in Puducherry, India

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Abstract

Introduction School health services is an economical and powerful means of raising community health and more important, in future generation. Our department plan is to strengthen the school health activities, including School health education as a part of Medical students' and Interns' training. Epidemiological information on school health is scarce and little has been reported from this region. Hence, we attempted to assess the nutritional status and morbidity related to personal hygiene among the school children's in rural area of Puducherry. **Method:** The present study was conducted in 2 rural schools in Puducherry. All children in the age group between 6 to 14 years who were present in the school were interviewed using questionnaire based on the Global School Health Survey (GSHS). Anthropometric measurements were taken as per guidelines of World Health Organization. To assess the nutritional status Body Mass Index (Kg/m^2) categories were formed using CDC 2000 reference. Data was entered and analyzed by using Epi_Info 3.4.3 software package. **Results:** The study included 381 girls and 482 boys. It was found that 371 (48.2 %) were normal and 380 (49.4 %) were thin. The boys were significantly more thin (60.3 %) than girls (41.7 %) ($p < 0.001$). In 56.6 % school children had complaints of head lice, which was significantly more in girls 72.2 % as compared to boys 37 %($p<0.001$). In 54.9 % of the school children history of current illness was present. In 39.9 % of school children nails were untrimmed and dirty. The other morbidities were 27.1%, had dental caries, 16.8% had wax in ears, and 10.0 % had history of passing worm. **Conclusion:** Considering the poor nutritional status and personal hygiene and related morbidities an intervention focusing health education efforts based on local epidemiology and behavioral practices is needed.

Key Words: School Children, Personal Hygiene, Morbidity

Introduction

School health services is an economical and powerful means of raising community health and more important, in future generation. Any discussion of a school health services must be based on the local health problems of the school child and the culture of the community. While the health problems of school children vary from one place to another, survey carried out in India indicate that the main emphasis will fall in the following categories: Malnutrition, infectious diseases, intestinal parasite, diseases of skin, eye and ear; and dental caries. Although studies have been conducted on health problems among school children in India [1,2,3,4] there are still several localities for which epidemiological information is not available. The department of Community Medicine, Sri Manakula Vinayagar Medical College and Hospital, Puducherry, has planned to strengthen the school health activities, including School health

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education as a part of Medical students and Interns training. Epidemiological information on school health if scarce and little has been reported from this region. Hence, we wanted to formulate a need based health plan and health education strategy based on the local epidemiological situation, which is required to address the majority of health problems which are preventable by simple health education[5]. Government of Puducherry follows various nutritional schemes[6] like, Mid-day Meal scheme, Shri Rajiv Gandhi Breakfast scheme and Shri Rajiv Gandhi evening milk scheme to improve the nutritional status of school children. Hence, we attempted to assess the nutritional status and morbidity related to personal hygiene among the school children's in rural area of Puducherry.

Materials and Method

A cross-sectional study was undertaken in the schools under Bahour Commune panchayat, a rural area of Pondicherry (renamed as Puducherry), and a union territory of India. It is, having population of 12,44,464 is located at 162 kms south of Chennai, the capital of Tamil Nadu[8]. Out of 11 Government schools in this region, 2 schools were feasibly selected. The study was conducted between February 2010 and May 2010. Permission was obtained from the school Principals prior to the study. All 863 students in the age group of 6 to 14 years, present on the day of survey were included in the study. The tools included were questionnaire, bathroom scale weighing machine and measuring tape. The school children were interviewed using questionnaire based on Global School-based Student Health Survey (GSHS) [9]. The school children's were interviewed and examined by the medical students, under the supervision of a team of faculty in community medicine, doctors and social workers through a scheduled visit. Five percent of the questionnaires were re-checked by the faculty, who supervised the survey. Anthropometric measurements such as height and weight of each child were obtained. Weighing scale was calibrated to the zero before taking every measurement. Body weight was taken to the minimum of 100 gram with minimum clothing with the subject standing motionless on the weighing scale and with the weight distributed equally on each leg. Height was taken to the minimum of 1 mm, with the subject standing in an erect position against a vertical scale and with the head positioned so that the top of external auditory meatus was level with the inferior margin of the bony orbit with eyes and head looking forward, a scale placed on the vertex of the head parallel to the floor. Body Mass Index (Kg/m^2) categories were formed using CDC 2000 reference.[10] Any morbidities related to personal hygiene suffered by the students was recorded and treatment for minor ailments were given. The quantitative data was entered and analyzed using Epi_Info 3.4.3 software package. Chi-square test was used to find out the significance.

Results

A total of 863 students in the age group of 6-14 years from two schools were enrolled in the study, out of which 381(44.1 %) were girls and 482 (55.8%) were boys.

Table 1: Status of malnutrition among school children (6-14 yrs)

Categories of BMI	Male (317)	Female (453)	Total (N=770)	*p-value
Thin (below 5th percentile)	191 (60.3)	189 (41.7)	380 (49.4)	<0.001
Normal (5th – 85th percentile)	118 (37.2)	253 (55.8)	371 (48.2)	<0.001
Overweight (85th -95th percentile)	6 (1.9)	8 (1.8)	14 (1.8)	0.897
Obese (more than 95th percentile)	2 (0.6)	3 (0.7)	5 (0.6)	0.822
Figures in parenthesis are percentages				

Table:1 shows the distribution of the study population according to their nutritional status determined by body mass index as per CDC 2000 reference. Overall about half (49.4%) of the children were found to be thin. It was observed boys 191 (60.3 %) are significantly thin than girls 189 (41.7%).

Indicators of personal hygiene and related morbidities in the present study are shown in table:2.

Table 2: Personal hygiene and related morbidities among school children (6-14 yrs)

Health indicators	Male (381)	Female (482)	Total (N=863)	P value
History of current illness	195 (51.2)	266 (55.2)	461 (53.4)	0.241
Epileptic fits	10 (2.6)	6 (1.2)	16 (1.8)	0.135
Personal hygiene				
Unclean and uncombed hair	51 (13.3)	23 (4.7)	74 (8.5)	< 0.001
Untrimmed and dirty nails	161 (42.2)	184 (38.1)	345 (39.9)	0.224
Unclean clothes	99 (25.9)	79 (16.39)	178 (20.6)	<0.001
Unclean teeth	61 (16.0)	90 (18.6)	151 (17.5)	0.306
Morbidities related to personal hygiene				
H/O passing worms	37 (9.7)	50 (10.3)	87 (10.08)	0.748
Presence of head lice	141 (37.0)	348 (72.2)	489 (56.6)	<0.001
Presence of multiple boils	8 (2.1)	7 (1.4)	15 (1.7)	0.469
Presence of Scabies	3 (0.7)	6 (1.2)	9 (1.0)	0.749
Discharge from ears	4 (1.0)	13 (2.7)	17 (1.9)	0.083
Wax in ears	52 (13.6)	93 (19.2)	145 (16.8)	0.027
Dental caries	103 (27.0)	130 (26.9)	233 (27.0)	0.983

Figures in parenthesis are percentages

In boys, untrimmed and dirty nails were more common problem seen in 42.2 % as compared to 38.1 % in girls. Again with regard to unclean clothes, boys (25.9 %) were worse off than girls (16.3 %). There was a difference in the sexes with respect to hair related hygiene where 13.3% of boys were found to have unclean and uncombed hair as compared to 4.7% of girls. Boys (16 %) showed a marginal decreased prevalence of unclean teeth as compared to girls (18.6%). However the prevalence of dental caries was distributed equally among the sexes.

Presence of head lice (56.6 %) was more common among personal hygiene related morbidities among school children, where 72% of the girls were found to be infested as compared to 37 % of boys .The other hygiene related morbidities in decreasing order were found to be dental caries, wax in ears, history of passing worms, discharge from ears, presence of multiple boils, and scabies. With respect to current illness, 55.2% of girls and 51% of boys were affected.

Discussion

A healthy body is necessary for school children to perform optimally at school. Promotion of proper nutrition is one of the eight essential elements of primary health care.

In the present study, 49.5% (60.3 % boys and 41.7% girls) of school children were classified as thin. The boys were significantly thinner than girls ($p<0.001$). Studies conducted in India[1,2,3] have reported similar findings among school children. In Programme Implementation Plan[11] (2011 – 12) published by Puducherry State Health Mission, undernourishment in school children is between 60 to 70 % and boys are more undernourished than girls. In spite of nutritional schemes in Puducherry like, Mid-day Meal scheme, Shri Rajiv Gandhi Breakfast scheme and Shri Rajiv Gandhi evening milk scheme are existing to improve the nutritional status of school children, still under nutrition is a common problem[7]. Poor nutrition of children not only adversely affects the cognitive development of children, but also likely to reduce the work capacity in future. Hence, urgent steps should be taken to identify the problem behind the nutritional status of school children and to correct them. And also periodic monitoring of nutritional status of school children is required.

In this study, overall the status of personal hygiene of the school children was poor. Untrimmed and dirty nails were the most common personal hygiene related problem among school children. About 39.9 % (42.2 % boy and 38.1 % girls) of children's nails were dirty and unclean. This results were comparable with studies done by Deb et al (49.5%

boys and 22.2% girls)[1] and Dongre et al (45.2% boys and 44.2% girls)[2]. It was found that 20.6 % school children wore unclean uniform. Our study showed a significant difference between the boys and girls, where boys faired worse than girls (25.9% vs 16.3 %) ($p < 0.001$). When compared to this present study about 16.6 % of school children in Dongre et al[2] and 20 % of the children in the Deb S et al study[1] wore unclean uniform. A similar trend was noticed for combed hair where only a very small percentage of girls showing uncombed hair in our study. The proportions of children's with unclean and uncombed hair were 8.5 % (13.3 % boys and 4.7 % girls) ($p < 0.001$). This finding was reversed in Deb S et al and Dongre et al studies where girls faired worse than boys[1,2]. Dental hygiene was much better in our study, 17.5 % children's teeth were unclean when compared to the Dongre[2] (59.1 %) study.

Among the personal hygiene related morbidities, head lice were common and half of the children had head lice infestation in their head (56.6 %). In a study at Wardha about 24.1 % of school children had head lice infestation[2]. In most of the studies the head lice was exclusively confined to girls which is similar to our study ($p<0.001$). The sexual predominance could be due to certain socio cultural reasons such as overcrowding, poor hygiene and long hairs[12].

The other morbidities related to personal hygiene in this study were dental caries, wax in the ears, history of passing worms, multiple boils, discharge from ears and scabies. The most common morbidities related to personal hygiene in the study by Deb et al were clinical pallor and a history of worm infestation. They have reported worm infestation in 39.8 % of boys and 29.6 % of girls as compared to 10% in our study. In a similar study, at Wardha[2] the most common morbidities were head lice (24.1 %), worm infestation (18.3%), dental caries (12.5 %), wax in ears (10.6%), multiple boils (8.6 %) and scabies (6.7 %). Our study had a higher rate of dental caries compared to the above studies. Scabies and worm infestation were found to be less in our study when compare to the above studies.

Conclusion:

In conclusion, our study shows that there is a high prevalence of malnutrition and poor personal hygiene and related morbidities in this particular locality. Malnutrition is a problem in spite of the existence of various nutritional welfare schemes. Thus, considering the poor nutritional status and personal hygiene and related morbidities an intervention focusing health education efforts based on local epidemiology and behavioral practices is needed.

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests**.**

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Evaluating the Fixed Nutrition and Health Day (FNHD) program in the rural area of Shamirpet, Ranga Reddy District and the urban area of Dabeerpura, Hyderabad District.

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Abstract:

Fixed Nutrition and Health Day (FHND) program combines the convenience of fixed day, fixed site service, with the provision of outreach services such as immunization, antenatal services, fixed food supplement distribution, health and nutrition evaluation and monitoring. The aim of this study was to evaluate the awareness, availability, and the satisfaction of FHND program. A community based cross sectional study was done in rural area of Shamirpet in Ranga Reddy district and urban area of Dabeerpura in Hyderabad District. Thirty cluster methods were used and STATA 11.0 was used to analyze the data. The analysis showed that food supplement distribution was not available as part of FHND program. Also ante and post natal care was also not available in rural areas. This study concludes that there is still a long way to deliver truly convergent service and efforts should be made at policy level and sufficient resources allotted to deliver more and better services through FHND program.

Key words: Fixed Nutrition and Health Day, Fixed Day, ANC

1. Introduction:

1.1 History of Fixed nutrition and Health Day program

The Integrated Nutrition and Health program started as a ten year program with two phases of five years in 1996-2001 and 2002-2006. It has evolved then and has been widely replicated across the country in various forms as Village Health and Nutrition Day or Fixed Nutrition and Health Day (FHND) under National Rural Health Mission (NRHM). It combines the convenience of fixed day, fixed site service, with the provision of outreach services such as immunization, antenatal services, fixed food supplement distribution, health and nutrition evaluation and monitoring. The National Rural Health Mission has been launched by the Government of India to carry out necessary architectural correction in the basic health care delivery system, especially in the rural areas with special focus on eighteen states. The goals of FHND are to reduce Infant Mortality Rate, Mortality rate, Fertility rate and aims at population stabilization, gender & demographic balance. Health also has an effect on education, healthier children can learn better spend more time at school and are better learners. India sees 1.8 million deaths every year children under of five years of age and 52 million children are stunted. 1/3are born with low birth weight, 48% are under weight for their age, 30% are wasted (too thin for their height), 62% preschool children and 16% pregnant women are deficient in Vit.A, 70% preschool children and 56% women are anemic. [1]

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The reasons for increased Infant mortality are several, such as low coverage of immunization, vaccine preventable diseases , unsafe drinking water, infection, anemia, missing children for vaccination unhygienic practices are focused here being the poverty ,malnutrition and harsh realities for millions of women and children .[2] Demographic, socioeconomic factors, relation to birth order, mothers education, primary care taker, infection, illness, health seeking behavior, feeding practices, and rural environment as per the NFHS (National Family Health survey) estimates. [3]

1.2 Services at Fixed Nutrition and Health Day program

Convergence of presently available services in varied timings and places to a fixed place and time is the concept behind FHND. The services provided under this concept nutrition action, community based new born care, antenatal care and primary immunization, empowering communities & building capacities of functionaries IFA and Vitamin A administration, growth monitoring, treatment for minor ailments, health education, promotion of institutional deliveries, facilitate referral. Also provided are take home rations, for pregnant lactating mothers and children 6-36 months' of age. [4-8]

2. AIMS AND OBJECTIVES

2.1 Aims

The aim of this study was to evaluate the awareness and performance of Fixed Nutrition and Health Day program in rural and urban areas of Andhra Pradesh state.

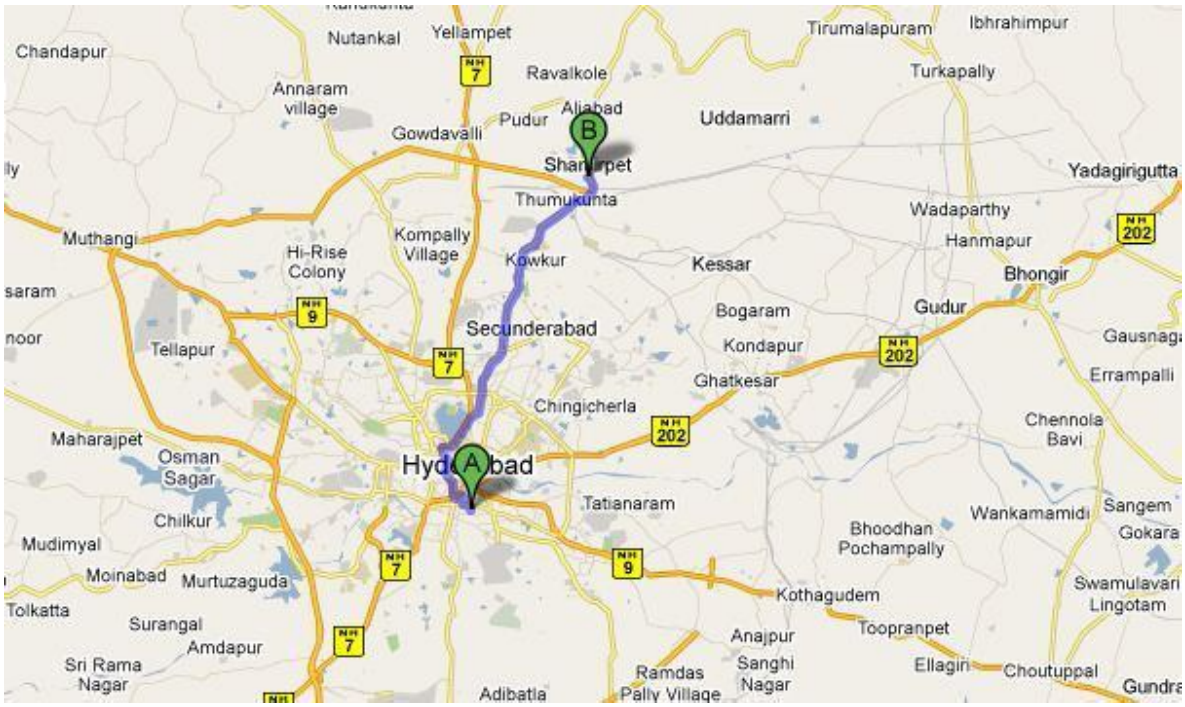
2.2 Objectives The objectives of this study are, among the beneficiaries of the FHND program:

1. To measure the level of awareness; 2. What is the source of information through which they get to know about the program; 3. What services are utilized by the beneficiaries; 4. Their level of satisfaction about the services, access to services; 5. Any deficiency of services and the utilization of private health care facility; 6. Socio demographic background of the beneficiaries.

3.MATERIALS AND METHOD

The study is a community based cross sectional study by design. The location for the study was chosen conveniently in rural area of Shamirpet in Ranga Reddy district and urban area of Dabeerpura in Hyderabad District as the principal investigator had working experience in both the areas.

Figure 1: Map showing the location of the study areas of Shamirpet (B) in Ranga Reddy district and Dabeerpura (A) in Hyderabad District



Though Hyderabad District is urbanized the study area is a slum comprising of 90% minority population, the occupation mostly being petty businessmen and laborers. Community based cross sectional study was done in both rural and urban areas and all children under five years of age will be selected.

The thirty cluster sampling frame method was chosen for generalisable representation of the study area. Selection of thirty clusters was done in both rural and urban areas. The Rural population of Shamirpet, Ranga Reddy consisting of nine sub centers with total population of 52264 which divided by thirty clusters and beneficiaries were selected from the 25 villages to get 210 beneficiaries. Each cluster comprised of 1700 population. Villages The Urban population of Dabeerpura was 12700 comprising of mostly Muslim population and included in six slums. The population was divided by 30 clusters to get 210 beneficiaries. All children under the age of five were included in this study. And preterm, newborn, congenital anomalies, severely ill children were excluded.

Teams of investigators under supervision and after training by the principal investigator, visited the selected households and the care givers of the children were asked to respond to a structured face to face interview arranged by the survey teams .Training workshops and supervised pre test interviews were held in Pilot study was done in the PHC Jawahar Nagar of Ranga Reddy District to standardize the data collection procedure .Each interviewer collected data using the structured questionnaire from both rural and urban areas of 210 beneficiaries each to a total of 420 beneficiaries. Questions were asked regarding the number of children born in the previous five years; age, sex, immunization status of last child, health care provision factors participation in health education, socioeconomic factors, knowledge of vaccine preventable disease, awareness of the program, source of information about the program, satisfaction of the services, access to health facility, any deficiency of services ,whether mother delivered the child at home or hospital, how they meet the deficient services and utilization of services.

The collected data was analyzed using STATA 11.0. Chi square tests were performed to analyze the significance of association among variables.

4. RESULTS

As showed in Table 1, one hundred percent of people who responded to the study knew about the FHND program. However in rural areas people knew about FHND through ASHA`s and in urban areas people knew through anganwadis. Surprisingly ante and post natal care services were not availed thru the FHND program in the rural areas, whereas in urban area 63% of people availed ante natal care service. Also food supplements were found to not availed or not provided by the service in both rural and urban areas. A high percentage of people; 79% in urban area and 92% in rural area expressed satisfaction with the FHND service.

Table 1: Village Health and Nutrition Day (VHND) Evaluation

Variable	Type	Number & Percentage In Urban	Number & Percentage In Rural
No of respondents		N=224	N=205
Know VHND		224 (100%)	205 (100%)
Through Health worker		107 (48%)	117 (57%)
Through ASHA		106 (47%)	203 (99%)
Through Anganwadi		200 (89%)	115 (56%)
Through community		94 (42%)	-
Services Availed	Antenatal services	141(63%)	-
	Postnatal services	23(10%)	-
	Food supplements	3(1.3%)	-
	Health education	212(94%)	16(7.8%)
	Nutrition education	214(95%)	118(57%)
	Janani suraksha yojana	212(94%)	65(31%)
	Family planning	213(95%)	99(48%)
	Neonatal care	-	69(33%)
Satisfied with services		179(79%)	189(92%)

Table 2 shows that in the urban area where the study was conducted the study, nearly 50% of the study sample had 3 or more children and in the rural area 87% had only one or two children, and this was statistically highly significant. This could be due to the fact as shown again in Table 2 that in the urban area where this study was conducted, 93% of the population belonged to Muslim religion whereas in the rural area, they were only 3% and the majority religion was Hindu at 96.5%. This also shows that people of same religion cluster around locations, in both rural and urban areas, and also shown to be statistically highly significant. A high percentage (96%) of people in rural areas owned their own homes whereas only 24% in urban areas owned their home; this again was statistically significant.

Although people in rural did not use the FHND service for ante natal care, majority of them at 99% received four or more times the service, as shown in Table 3. Both in rural and urban areas the over whelming (at 99%) preferred provider was the Government health centers. However when it comes to delivering the baby 56% of rural respondents and 13% of urban respondents chose private service providers. After delivery there is again an over whelming shift towards government service providers for vaccination. All these data were statistically significant. The average weight of the child in rural area was 2.7 Kgs which was slightly lesser than the average weight of the child in urban area; however this difference was not statistically significant.

Table 2: Socio Demographic Status of VHND survey respondents

Variable	Type	No (%) In Urban	No (%) In Rural	p-value
No of respondents		N=224	N=205	
No of Children in family	1 2 3 4	25(12.5) 73(35) 80(39%) 20(11.7)	73(36) 104(51) 21(10) 2(1)	<0.001
Gender of children assessed	Male Female	122(55) 100(45)	111(54) 94(46)	0.867
Type of family	Nuclear Extended	157(70) 66(30)	129(64) 74(36)	0.132
Type of House	Own Rented	53(24) 167(76)	179(93) 12(7)	<0.001
Religion	Hindu Muslim Christian	13(6) 207(93) 4(1)	198(96.5) 6(3) 1(0.5)	<0.001
Transport	Car Bike Auto Bicycle Public transport	3(1.3) 36(17.5) 117(57) 5(2.3) 59(27)	0 3(1) 72(35) 3(1) 125(61)	<0.001
Landline Telephone		3(1.3%)	6(10)	NS
Mobile Telephone		220(98)	202 (98)	NS
Television		184(82)	192(94)	NS
Radio		10(4.5)	14(7)	NS

Table 3: ANC, Delivery and Vaccination Status of the VHND Respondents

Variable	Type	No (%) In Urban	No (%) In Rural	P-Value
No of respondents		N=224	N=205	
ANC Registration		219(98)	205(100)	
Antenatal check up	3 4 5	128(58) 13(5.9) 78(35.6)	3(1) 84(42) 117(57)	<0.001
Type of facility for ANC check up	Govt. - hosp. PHC SC Private - hosp. Other	78(39) 0 116(58) 0 5(2.5)	1(0.5) 45(22) 156(76) 1(0.5) 1(0.5)	<0.001
Place of delivery	Govt. - hosp PHC SC Private - hosp. Others	187(85) 0 3(1.3) 29(13) 1(0.4)	7(4) 56(33) 0 94(56) 10(5.9)	<0.001
Vaccination place	Govt. - hosp PHC SC Private - hosp. Others	98(46) 1(0.5) 110(53) 0 0	1(0.5) 2(1) 167(98.8 0 0	<0.001
Average weight of child		3.0Kgs	2.7Kgs	NS
Average age of the child		1.4 Months	1.2 Months	NS

5. DISCUSSION AND CONCLUSION

As we see from our study the concept of convergence of services are yet to take place. Provision of nutritional supplements are simply not available as part of the FHND service in both rural and urban areas. Also ante and post natal care is also not available at the rural areas.

It is also seen that in rural areas majority of people give birth to babies in privately run health care institutions. FHND should be strengthened to promote deliveries in government institutions. Also it is seen that in the urban slum where this study was conducted family planning advice has not made any significant impact on the population and majority of them have more than two children. FHND should also be strengthened to deliver better advices for family planning.

In conclusion this study shows that although FHND services take place regularly and people are satisfied with the available services; there is still a long way to deliver truly convergent service and efforts should be made at policy level and sufficient resources allotted to deliver more and better services through FHND program.

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ORIGINAL RESEARCH ARTICLE

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Nutritional Status and Correlation With Fetal Outcome in Antenatal Women of South India

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Abstract

Introduction: Pregnancy in chronically undernourished mothers with perpetual semi-starvation throughout the gestation often results in delivery of low birth weight (LBW) babies, especially the growth retarded one. **Objectives:** To assess the nutritional status of antenatal women delivered at JIPMER and to identify the correlation between their nutritional status and fetal outcome. **Materials and Methods:** Total of about 1449 cases were taken from a period of one year from 1992 – 1993. The cases were selected by taking every third case delivered in JIPMER hospital. Their height and weight were measured using standard methods. **Results:** The average height of patients in this study was 148.3 $\pm$ 11.03 cm. Out of 1449 patients, 27.12% had height less than 145 cm, 30.78% had height between 146 and 150 cm, 36.71% had height between 151 and 155 cm, 4.07% had height between 156 and 160 cm and 1.31% had height more than 161 cm. The average weight of patients in this study was 51.88$\pm$7.64 kg. Out of the 1449 patients 11.25% had weight less than 45 kg, 31.33% had weight between 46 – 50 kg, 34.71% had weight between 51 – 55 kg. 17.46% had weight between 56 – 60 kg and 5.24% patients had weight more than 61 kg. **Discussion:** In our study, there was increase in birth weight with increasing height but the difference was statistically significant only in the group between 146 – 150 cm and 151 – 155 cm and between height less than 145 cm and height more than 160 cm. There was statistically significant increase in birth weight upto maternal weight of 55 kg. Increase in maternal weight beyond 56 kg did not produce statistically significant increase in birth weight. **Conclusion:** This study recommends that improving the nutritional status of mother, not only during pregnancy, but also in her early childhood by undertaking food supplementation programs implemented through National Health Programs will improve fetal outcome.

Key words: Antenatal women, Height, Weight, Perinatal mortality

Introduction:

In developing country, the nutritional status of women in reproductive age group is far from satisfactory. The fertility rates are high and their diets are deficient in calories and many other essential nutrients from early childhood to adulthood. This long term chronic nutritional deprivation results in poor body size of mother[1, 2]. Pregnancy in such chronically undernourished mothers with perpetual semi-starvation throughout the gestation often results in delivery of low birth weight (LBW) babies, especially the growth retarded one. Assessing the nutritional status of antenatal women and its correlation with fetal outcome (birth weight and perinatal mortality) may make us implement different programs to decrease perinatal mortality and improve fetal outcome. As women from various socioeconomic strata with various ethnic backgrounds deliver at Jawaharlal Institute of Postgraduate Medical Education and Research

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(JIPMER) this makes the present study more cosmopolitan and hence we are able to assess better influence of the nutritional factors and its effect on fetal outcome.

Objectives:

1. To assess the nutritional status of antenatal women delivered at JIPMER and
2. To identify the correlation between their nutritional status and fetal outcome

Materials and Methods:

This study was conducted in the department of Obstetrics and Gynaecology and Paediatrics of JIPMER hospital over a period of one year from 1992 to 1993. The cases were selected by taking every third case delivered in the hospital. Total of about 1449 cases were taken for this study. Their nutritional status were assessed by their height and weight.

Maternal height: Measured in centimeters. Patients were made to stand against a wall where a scale had been marked. They were made to stand erect barefoot with feet together, the heels and back touching the wall and looking horizontally ahead.

Maternal weight: Mothers were weighed before delivery at the time of entering into the labour room. Weights were taken to the nearest half kilo and the scales were checked periodically.

Results:

The average height of patients in this study was 148.3 $\pm$ 11.03 cm. Out of 1449 patients, 27.12% had height less than 145 cm, 30.78% had height between 146 and 150 cm, 36.71% had height between 151 and 155 cm, 4.07% had height between 156 and 160 cm and 1.31% had height more 161 cm. The mean birth weight in those patients with height less than 145 cm was 2.509$\pm$0.583 kg, in those with patients height between 146 - 150 cm, it was 2.572$\pm$0.569 kg. In those with height between 151 - 155 cm it was 2.675$\pm$0.552 kg. In those with height between 156 - 160 cm the mean birth weight was 2.783$\pm$0.462 kg and in those with height more than 161 cm the mean birth weight was 3.001$\pm$0.432 kg (Table 1). The difference in mean birth weight with height between 146 – 150 cm and 151 – 155 cm was found to be significant ($P < 0.01$) while the difference in birth weight between the patient with height less than 145 cm and more than 161 cm was found to be highly significant ($p < 0.001$). The difference in mean birth weight between other groups was not found to be statistically significant ($p > 0.05$).

Table 1 Maternal height and fetal outcome (Perinatal mortality and Mean birth height)

Height (cm)	No (%)	Mean birth weight (kg)	PNMR*
$\leq$ 145	393 (27.12)	2.509+0.583	5.34%
146 -150	446 (30.78)	2.572$\pm$0.569	3.14%
151 -1 55	532 (36.71)	2.675$\pm$0.552	3.01%
156 –1 60	59 (4.07)	2.783$\pm$0.462	1.69%
$\geq$ 161	19(1.31)	3.001$\pm$0.432	0%

* *Perinatal mortality*

The perinatal mortality rate decreased with increasing maternal height. The perinatal mortality rate in those with height less than 145 cm was 5.34% while in those patients with height between 146 – 150 cm it was 3.14% and those patients with height between 151 – 155 cm it was 3.01% and perinatal mortality rate was 1.69% in those patients with height between 156 – 160 cm. There was no perinatal mortality observed in patients with height more than 161 cm. But the difference in perinatal mortality with varying maternal height was not found to be statistically significant ($p > 0.05$).

Table 2 Maternal weight and fetal outcome (Perinatal mortality and mean birth height)

Weight (in Kg)	No (%)	Mean birth weight (kg)	PNMR**
$\leq$ 45	163 (11.25)	2.335 $\pm$ 0.588	7.98%
46 -50	454 (31.33)	2.536$\pm$0.560	4.19%
51 - 55	503 (34.71)	2.638$\pm$0.527	2.19%
56 - 60	253 (17.46)	2.762$\pm$0.559	2.77%
$\geq$ 61	76 (5.24)	2.894$\pm$0.547	2.63%

* *Perinatal mortality*

The average weight of patients in this study was 51.88±7.64 kg. Out of the 1449 patients 11.25% had weight less than 45 kg, 31.33% had weight between 46 – 50 kg, 34.71% had weight between 51 – 55 kg. 17.46% had weight between 56 – 60 kg and 5.24% patients had weight more than 61 kg. (Table 2)

There was found to be a statistical significant increase in birth weight with increase in maternal third trimester weight from less than 45 kg to 55 kg. No significant difference was observed in mean birth weight with further increase in patient weight.
The perinatal mortality was 7.98% in those patients with maternal weight less than 45 kg, patient with maternal weight in range of 46 – 50 kg had perinatal mortality of 4.19%, 2.19% in range of 51 – 55 kg, 2.77% in the weight range of 56 – 60 kg and 2.63% in those with weight more than 61 kg. However, the difference in mean birth weight between these various groups was found to be statistically insignificant ($p>0.05$).

Discussion:

Maternal height:

In our study, there was increase in birth weight with increasing height but the difference was statistically significant only in the group between 146 – 150 cm and 151 – 155 and between height less than 145 cm and height more than 160 cm. A study by Mukherjee and Sethna[3] came to similar conclusions that with the increase in height of the mothers the mean birth weight of the newborn increases. In our study, there was a gradual increase in mean birth weight with height. Thus, a direct relationship was observed between mothers height and birth weight of the offspring. A study by Ghosh et al[4] found that mean birth weight among the infants of the tallest mothers was significantly higher than the infants of shortest mothers. They found a difference of 430 gm in the birth weight at the two extremes. In our study, we found difference of 500 gm in birth weight at the two extremes.

Maternal weight:

There was statistically significant increase in birth weight upto maternal weight of 55 kg. Increase in maternal weight beyond 56 kg did not produce statistically significant increase in birth weight. This study also corroborates that of Chabra et al[5] and Swain et al[6], who believed that the effect of maternal weight on the birth weight is very significant. Contrary to our findings North[7] found no association of maternal weight with birth weight of babies. However, their study population was derived from largely middle class white background where maternal malnutrition was not a significant problem.
This study recommends that improving the nutritional status of mother, not only during pregnancy, but also in her early childhood by undertaking food supplementation programs implemented through National Health Programs will improve fetal outcome.

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Alcohol Consumption, Harmful Use and Dependence among Adult Males in a Village

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Abstract:

Background: Alcohol use is a common problem among adult males in villages and can lead to medical and social problems. **Objectives**: To study prevalence of alcohol consumption, harmful use and dependence among men aged over 18 years in a village and to determine factors associated with alcohol consumption. **Methodology:** A house to house survey was done and male residents (>18 years) in Tarabanahalli village were administered Alcohol Use Disorder Identification Test (AUDIT) and Michigan Alcohol Screening Test (MAST). Focus Group Discussions, Key Informant Interviews and Social Mapping were done to collect qualitative data. **Results**: Prevalence of alcohol consumption was 33% (Current use: 23.4%, Past use: 9.6%); Among those who had consumed alcohol in the last year, harmful use was 40% and dependence was 14.5%. Most common reason for initiation of alcohol was peer pressure (58%). Alcohol consumption was associated with illnesses, domestic violence and financial difficulty. **Conclusion**: Alcohol use, particularly, harmful use and dependence is common among adult males.

Key words: Alcohol, Harmful use, Dependence, Alcohol Use Disorder Identification Test (AUDIT), Michigan Alcohol Screening Test (MAST).

Introduction

Alcoholism is drinking alcoholic beverages at a level that interferes with physical, mental and social health and family or job responsibilities. According to estimates by the World Health Organization, alcoholism contributes to four percent of the total Disability Adjusted Life Years (DALYs) lost and alcohol use disorders account for 1.4% of the total burden of disease.[1]

The pattern of drinking in India has undergone a change from occasional and ritualistic use to being a social event. Alcohol and substance use disorders are predominantly socio-cultural phenomena in the early stages of experimentation which, with later abuse, acquire a distinct biological basis rooted in altered neurochemistry and functioning.[2] Long-term alcohol consumption is linked to a wide variety of social (family disruption, marital disharmony, impact on children, deprivation of the family, work absenteeism, growing rates of crime and violence, etc.) and health (cirrhosis of the liver, road traffic injuries, suicides, etc.) problems.[2]

Harmful use of alcohol is defined as "a pattern of alcohol use that is causing damage to health. The damage may be physical or mental".[3] Dependence syndrome has been defined as "cluster of physiological, behavioural, and cognitive phenomena in which the use of a substance or a class of substances takes on a much higher priority for a given individual than other behaviours that once had

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greater value. A central descriptive characteristic of the dependence syndrome is the desire (often strong, sometimes overpowering) to take psychoactive drugs (which may or may not have been medically prescribed), alcohol, or tobacco. There may be evidence that return to substance use after a period of abstinence leads to a more rapid reappearance of other features of the syndrome than occurs with nondependent individuals" .[3]

In view of the public health importance of alcohol-related health and social consequences, it is important to estimate the amount of alcohol consumed and gather information on the pattern of drinking. There were reported cases of alcohol related injuries and domestic violence in a local health centre in the area which prompted us to undertake this study.

Objectives:

1.To study prevalence of alcohol consumption, harmful use and dependence among men aged over 18years in a village

2.To study the factors associated with alcohol consumption.

Materials and Methods:

This was a cross-sectional study that was undertaken in Tarabanahalli village under Hesaraghatta PHC area, Bangalore North Taluk, Bangalore Urban District, Karnataka between April to June 2010. A house to house survey was done and all the adult males (>18 yrs) who had been residents of Tarabanahalli for at least a year prior to the study were interviewed. Written informed consent was taken from all willing participants. Men in those households which were locked even after 3 home visits by the investigators and men who could not communicate due to reasons like serious sickness were excluded from the study.

Based on nationwide prevalence of alcohol use of 21% among adult males, by Ray et al. in 2004 we estimated that 255 adult males would be required to be included in the study at an absolute precision of five percent and at 95% confidence level. However, for the study a door to door houselisting for adult males in the village was done. This yielded a sample of 264 consenting adult males.

Quantitative data from the respondents were collected using a structured interview schedule that contained demographic details and factors associated with alcohol use. Alcohol dependence was assessed using a local language translated version of Alcohol Use Disorder Identification Test (AUDIT) and alcohol abuse was assessed using Michigan Alcoholism Screening Test (MAST)

AUDIT is an instrument used to screen for alcohol-related problems in adult populations.[4] It assesses three domains of alcohol use by means of ten questions with a score range of 0-40:[5]

A cut-off value of eight points yielded sensitivities for the AUDIT for various indices of problematic drinking that were generally in the mid 0.90's. Specificities across countries and across criteria averaged in the 0.80's.[5]

MAST is one of the most widely used measures for assessing alcohol abuse. Its modified version has 22 questions with a scoring of zero to two indicating no apparent problem, three to five early/middle problem, and a score of more than six indicating a problem drinker[7] MAST has a specificity of 98.7% for alcohol dependence.[8]

Qualitative data were collected by conducting focus group discussions, key informant interview and social mapping.

Focus Group Discussions (FGD) were done in two groups of men and two groups of women, each group comprising six to seven residents representing different parts of the village. Each FGD lasted for about 40 minutes. A common topic guide comprising of eleven questions each was used.

A social map of the village was prepared by adolescent school students. For this purpose we visited two high schools in the village and gathered together five girls and five boys from each school who were students of the eight standard.

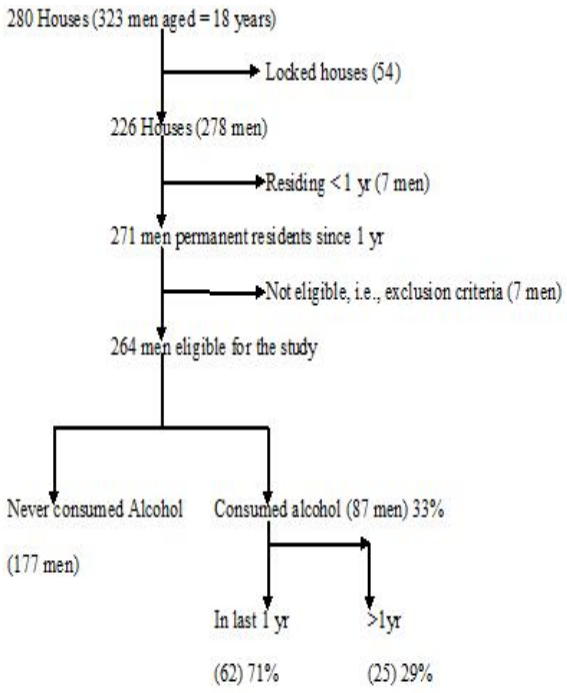
Key Informants in the village including panchayat leader of the village, administrative medical officer of a private health centre, adolescent students, headmaster of the local school, wine shop owner were interviewed using a topic guide with each interview for about thirty minutes.

Quantitative data were coded and entered in Microsoft Excel and analysed using Epi info v3.5.1 for proportions, frequencies and associations. Qualitative data were analysed based on the most common response for each question.

Results

A total of 264 adult males above 18 years of age were recruited for the study. The mean age of the study population was 35.97 ± 15.05 years. Out of the total population that was studied 87(33%) were alcohol users. {Current use – 62(23.4%), Past use – 25(9.6%)}. Among the total number of current alcohol users, 21 men (41%) depicted harmful use of alcohol (by AUDIT score ≥8) and 9 men (14.5%) were dependent on alcohol (by MAST score ≥6). Figure 1 depicts the selection of study subjects in the form of a flow chart.

Figure 1



Most of the alcohol users were in the age group of 26-40 yrs (42%) followed by 41-60 yrs (29%). Most of them (48.5%) had attained high school education. Most of them (84%) were currently employed. Alcohol use showed a statistically significant association with increasing age, current marital status and current employment status. The demographic details are as shown in the Table 1.

Table 1: Demographic details of alcohol users and non users

Variable	Non alcohol users N=177	Alcohol users N=87	Total N=264	p value
Age (in years)				
18-25	61 (79.2)	16 (20.8)	77 (29)	**p<0.05**
26-40	71 (63.4)	41 (36.6)	112 (42)	
41-60	29 (56.9)	22 (43.1)	51 (19)	
>60	16 (66.7)	8 (33.3)	24 (10)	
Highest education attained				
No formal education	12 (57.1)	9 (42.9)	21 (8.0)	p>0.05
Primary education	9 (60.0)	6 (40.0)	15 (5.7)	
High School	85 (66.4)	43 (33.6)	128 (48.5)	
Pre university	48 (78.7)	13 (21.3)	61 (23.1)	
Degree	23 (59.0)	16 (41.0)	39 (14.8)	
Currently Employed				
No	34 (81.0)	8 (19.0)	42 (15.9)	**p<0.05**
Yes	143 (64.4)	79 (35.5)	222 (84.4)	
Mean (SD) per capita monthly income in Rs	2182 ± 1665	2579 ± 2338	2313	p>0.05
Currently Married				
Yes	112 (62.2)	68 (37.8)	180 (68.2)	**p<0.05**
No	65 (77.3)	19 (22.7)	84 (31.8)	

Mean age of first drink was 22.87 years (Range: 6 – 45 years). Peer pressure was the most common reason to start drinking (58%), followed by curiosity (24.2%), family tension (11.3%), problems at job (6.5%).

Among those who consumed alcohol in last one year, there was no significant association (p>0.05) between any of the study variables (age, education, income, age at first drink, family type) with the harmful use of alcohol and dependence.

Results of the qualitative study highlighted the major concerns regarding alcohol use in the village. A total of four focused group discussions were held. All the groups reported that alcohol consumption was commonly seen in 70-90% of the men in that village. Most people perceived alcohol use to be associated with various medical, psychosocial and financial problems like liver damage, unemployment, domestic violence and depression. The common age group for initiating alcohol consumption was around 13-20 yrs. Most common reason of starting a drink was peer pressure. Other common reasons included curiosity and mental stress. Maximum alcohol drinking was in a particular colony in the village where people from a lower caste resided. Fights related to alcohol use were common as were health problems due to illicit liquor use. The participants quoted that alcohol was distributed among the villagers to win votes during the panchayat elections. Two deaths were reported due to consumption of illicit liquor. Most participants were of the opinion there was no definite solution to this problem, other than self motivation. Many of them were aware of the existence of de addiction centres. All the participants believed that controlling the alcohol problem would benefit the village. However they also believed that there were other issues in the village like water supply and sanitation that also needed attention.

The views expressed by the key informants were largely similar to those expressed by the participants of the focused group discussions. However the panchayat leader opined that all men in the village consumed alcohol, irrespective of their socio economic status or caste. She also felt that nothing could be done about this problem as men would any way continue to drink and that it was better to leave them alone. On being asked whether the village would improve if the alcohol problem is brought under control the principal of the local government school expressed that it would make no difference since “village will remain the same village”.

Discussion

Prevalence of alcohol use among 264 adult men (≥18 years and older) in the rural village of Tarabanahalli was measured quantitatively using a questionnaire and also qualitatively through four focus group discussions and seven key informant interviews with community members. Through the questionnaire, the prevalence of alcohol consumption was found to be 33% (current use: 23.4%; past use: 9.6%), while the prevalence of harmful use and dependence was 40% and 14.5%, respectively. The most common reason reported for beginning to drink was peer pressure (58%), followed by curiosity (24.2%), family tension (11.3%), and problem(s) at one’s job (6.5%). None of the factors studied were associated with alcohol use. However, harmful use was found to be associated with alcohol dependence ($p<0.05$). The focus group discussions and key informant interviews with community members revealed these participants perceived the range of prevalence of alcohol consumption among residents of Tarabanahalli to be between 70% and 100%. These participants also noted that as a result of alcohol, fights, accidents, and police reports were common. Most did not feel as if there was a definitive solution to the problems related to alcohol in Tarabanahalli.

Alcohol use has long been known to cause individual health problems as well as social and economic hardships. These findings show that alcohol use, harmful use, and dependence are all problems in Tarabanahalli, and possibly also an issue in villages of similar size and structure throughout India. In addition to it being evident through the results of the questionnaire, the community also feels similarly as was made apparent through the FGDs and key informant interviews. A significant association was found between harmful use and alcohol dependence; this suggests that harmful use could lead to alcohol dependence. Our findings are important because they highlight the need for public health programs in villages to combat the problems associated with alcohol.

There have been studies undertaken both in India and at an international level assessing the harmful use of alcohol, most of them by means of AUDIT. Nationwide prevalence of alcohol use is 21% of adult males, but there is a large variation in

prevalence across the country. Other studies have found prevalence of alcohol use in India to be between 23% and 24% in males and past use as 9.6% among middle aged and elderly men in western India. Prevalence of life-time use over five districts in Karnataka, South India, as 46.7% (95% CI 43.8-54.7). This is similar to a study undertaken in Punjab which found 49.2% ever-use of alcohol among male college students. Rural prevalence of alcohol consumption by Indian adults has been found to be 61% among rural males, over the age of ten, it was 60%. This demonstrates the significantly higher prevalence of use among rural and lower-socioeconomic urban sections. Prevalence of harmful or hazardous drinking has been found to be from 9.3% to 15% in adult Indian males. While the present study found 3.4% of the total sample to be dependent on alcohol, Chavan et al. (2007) found the prevalence of alcohol and drug dependence in rural and slum populations of Chandigarh to be 6.88%. With regards to education, prevalence of alcohol use in men has previously been found to be highest in higher educated men (63%) compared to illiterates (13%) and those with primary education (24%), while we found no statistically significant differences in prevalence by educational attainment [9-19]

Other studies conducted both within India and internationally show dissimilar prevalence but similar related issues when compared to results from studies undertaken in India. In a study in the USA on a Venezuelan-native American population, prevalence of alcohol consumption was 98% and harmful use was found to be 86.5% among men (using AUDIT). Qualitative data revealed that there were alcohol-related problems including fights, vehicular accidents, poverty, medical illness and family problems. Unlike the present study, the participants expressed a desire for help to decrease alcohol-related problems in their community.[12]A study conducted by NIMHANS, Bangalore, and sponsored by the World Health Organization (WHO) shows that 20% of women reported domestic violence and 94.5% of these women identified their husband's alcohol consumption as a risk factor in incidents of domestic violence[3]. Another study done at NIMHAMS found that nearly 40% of health problems and unintentional injuries have been reported to be linked to alcohol use[1]. In our study, participants of the focus group discussion and key informant interviews voiced their belief that there was no definitive solution to the problem of harmful alcohol use and alcohol dependence. With health education and community support, is it hoped that this attitude will change in the future.

Our study found that initiation of alcohol consumption was 22.9 years of age, which is later than the mean age found in a study done on substance abuse patients admitted in Central Institute of Psychiatry, Ranchi 2005-2006, in which the mean age at onset of alcohol use was 18.72 years. [12] Another study shows the age of first alcoholic beverage was 18.7 among male college students in Punjab, India.[13] The reason for this discrepancy could be that college students may experience peer pressure upon entrance into college and thus may begin drinking earlier which was not the case in our study population, most of whom did not go to college at all. Also, substance abuse patients are not a sample representative of the general population and thus may have a different age of initiation. This study also noted that the most common reason for beginning to drink alcohol was encouragement from friends (38.8% of the sample), which is similar to our finding of 58.1% of the sample reporting peer pressure as the most common reason.

The quantitative data showed a lower prevalence of alcohol use than was found through the qualitative data collection. The range of prevalence of alcohol use reported through the focus group discussions and key informant interviews was 70% to 100%, which is significantly higher than the prevalence of 33% found through the questionnaire. This could have been due to apprehension about reporting the truth on the questionnaire or overestimation by key informants and focus group discussion participants.

This study has several limitations. This study was conducted in only one geographic area—the village of Tarabanahalli in rural Karnataka, India. Ideally,

further studies should be carried out in a variety of geographic regions throughout India. Another limitation is the higher reported perceived prevalence of alcohol use in the village (from the qualitative data) versus the findings from the questionnaire. This may be because the questions asked in the questionnaire differed considerably than those asked in the focus group discussions and key informant interviews. For example, the question asked in the key informant interviews and the focus group discussions was "how many people in the village drink on an average?" which is not the same as the item in the questionnaire that asks specifically about individual use, not opinions of other village members' use. Another one of the questions the FGD participants and key informant interviewees were asked was "have there been incidents of major fights, murders, police cases or accidents in the past year," rather than open-ended questions. Additional focus group discussions and key informant interviews are needed to provide reliability.

While there were limitations, there were also several strengths of this study. The collection of qualitative data through focus group discussions and key informant interviews is a major strength. Although the quantitative data asked key information, only the focus group discussions and interviews with key informants were able to provide first-hand opinions to the issue at hand. The community members were able to voice their concerns and beliefs about alcohol use in this village. Another strength is the high percentage of those eligible that actually participated in the study (82%).

Further research in the area of alcohol use, harmful use, and dependence in villages in India needs to be pursued. The discrepancies between quantitative and qualitative data in the present study highlight the fact that the prevalence and issues surrounding alcohol use in rural villages are still not completely understood. Ideally, future studies should have more representative samples to provide greater power and increase generalizability to other populations.

Based on the findings of this study, alcohol use in villages is a problem that needs to be addressed. Health education and policy regulations need to be directed at the rural population involving the local youth to reduce the problem of alcohol use. Because first alcohol use is found to start at young age, awareness and prevention efforts should be focused toward youth.

The objectives of the present study—to determine prevalence of alcohol consumption, harmful use and dependence among men aged at least 18 years in a village and to determine factors associated with alcohol consumption—were met. Alcohol use and particularly, harmful use and dependence, is common among males in this sample. Common alcohol-related problems in this village include fights, accidents, and police reports, and community members are unaware and unhopeful of a definitive solution. The study process also created awareness among the participants related to the harmful effects of alcohol, especially during the focus group discussions. Future research with more widely representative samples in a variety of geographic areas will provide more insight into the problems surrounding alcohol use, harmful use, and dependence in rural villages in India.

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Staff of Nirmala Health Centre, Tharabanahalli

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Conflict of Interest

None Declared

ORIGINAL RESEARCH ARTICLE

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Co-Infection of Malaria and Leptospirosis - A Hospital Based Study from South India

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Date of Submission: 16.03.2012 Date of Acceptance: 28.0.2012

Abstract:

Introduction: Co-infection of Malaria and Leptospirosis is common in the regions where both diseases are endemic. As the clinical features are non-specific and similar it is difficult to differentiate either of these illnesses. Also, both these illness can present with similar complications such as jaundice & renal failure. **Aim**: To assess the prevalence of co-infection of Leptospirosis and Malaria in patients admitted with fever. **Methods:** Patients with fever admitted to a Government facility in South India who tested positive for Plasmodium vivax / falciparum by Peripheral Smear / Quantitative Buffy coat (QBC) were investigated for co- infection with Leptospirosis utilizing MSAT (Macroscopic slide agglutination test- 2+ and above). All patients tested positive by MSAT were further confirmed by Microscopic Slide Agglutination Test (MAT) (titers of 1:80 and above). Patients positive for both malaria and Leptospirosis were taken up for the study and were evaluated for relevant clinical features and Lab profile. **Results and Discussion:** 220 Patients with malaria were analyzed and 48 (22 %) were found to be positive for Leptospirosis. Vivax malaria occurred in 36 patients, Falciparum malaria in 9 patients and 3 patients had both vivax and falciparum malaria in the 48 patients with leptospirosis co-infection group. Fever, Headache, Myalgia were the common symptoms of our Co-infection group & 19 % had Jaundice, 12 % had CNS manifestations, 10 % had Anemia, 4 % had Renal Failure. Uncomplicated Malaria & Leptospirosis were treated by Chloroquine and Doxycycline & Severe Malaria / Leptospirosis were treated by I.V Quinine / I.V Penicillin. This study had revealed that it is essential to evaluate for Leptospirosis in all patients with fever especially in endemic areas as Co-infection is common.

Key words: Malaria, Leptospirosis, Co-Infection

Introduction

Co-infection of Malaria and Leptospirosis is common in the regions where both diseases are endemic[1]. As the clinical features are non specific and similar it is difficult to differentiate either of these illnesses. Both these illness can present with similar complications such as jaundice & renal failure. Chennai is an important coastal metropolis in South India in the state of Tamil Nadu and has a land area of 172 Km^2 with a population around 6 millions. This study has been undertaken at a Government teaching hospital in North Chennai, Tamil Nadu to evaluate the prevalence of co-infection.

Methods:

All cases that fulfill the following criteria were admitted. a) Fever more than 5 days and /or b) Fever with any associated organ dysfunction. All these patients are investigated for malaria, leptospirosis,

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tuberculosis, enteric fever, pneumonia and other common causes of fever.

Patient's positive for both malaria and Leptospirosis were taken up for the study and were evaluated for relevant clinical features and Lab profile. Patients with fever who tested positive for Plasmodium vivax / falciparum by peripheral smear study / QBC were investigated for co- infection with Leptospirosis utilizing MSAT (Macroscopic slide agglutination test- 2+ and above) .We have utilized a simple and sensitive MSAT for early detection of Leptospirosis and utilized Modified Faine's score of > 25 for diagnosis of leptospirosis[2]. All patients tested positive by MSAT were further confirmed by MAT (titers of ≥ 1:80).

A total of 220 Patients with malaria (183 vivax malaria & 37 falciparum malaria) were analyzed of which 48 patients (22 %) were found to be positive for leptospirosis. There were 22 males & 26 females and the mean age was 29 years. In the co-infection group 36 patients had vivax malaria, 9 patients had falciparum malaria and 3 patients had both vivax and falciparum malaria. Fevers, Headache, Myalgia were the common symptoms of our co-infection group. Clinical features of our study group is shown in Table:1.

Table:1 Presenting clinical features of the study population

Clinical Features	No (%)
Fever	48 (100 %)
Headache	39 (81 %)
Myalgia	18 (38 %)
Loose stools	01 (2 %)
Hemoptysis	01 (2 %)

Complications of vivax and falciparum malaria with leptospirosis co-infection is shown in the table 2.

Table 2: Types of complications in the study population

Complications	No. (%) n- 48	Mean lab values(Range)
Anemia (Hemoglobin< 8 gms/dl)	5 (10%)	7.4 (5.2-8)
Jaundice Serum Total Bilirubin (>1.5 mg)	9 (19%)	4 (1.6-7.6)
SGOT(IU/L)	9 (19%)	113 (26-418)
SGPT (IU/L)	9 (19%)	111 (40-424)
Renal Failure (Serum Creatinine >1.5 mg)	2 (4%)	2.7 (1.6-3.8)
Cerebral Malaria (Fits&Altered Sensorium)	6 (12%)	-

There were no complications noted in the 3 patients who had both vivax & falciparum malaria with leptospirosis co-infection.

Uncomplicated malaria and leptospirosis were treated by Chloroquine and Doxycycline and severe malaria / leptospirosis were treated by I.V Quinine / I.V Penicillin. All patients survived. This study had revealed that it is essential to evaluate for Leptospirosis in all patients with fever especially in endemic areas as co-infection is common. A study from Thailand has revealed co-infection is an important problem in endemic areas. They reported seven cases of co-infection of leptospirosis and malaria who presented with fever, headache and myalgia[1] . A case report from Chandigarh, India has revealed co-infection of malaria & leptospirosis[3].

Simultaneous infection of malaria with filariasis, salmonella, dengue, retroviral infections and borrelia have been reported[1] .Malaria induces a hypoimmune state & therefore the host is vulnerable to other infections. Data on co-infection with leptospirosis are limited. Leptospirosis is difficult to diagnose as diagnostic tools are unavailable in remote areas. It is common practice in a malaria endemic area that if an acutely febrile patient is found to be malaria-positive,

malaria is assumed as the sole cause of fever. Failure to recognize acute leptospirosis co-infection may delay the initiation of proper therapy and possibly ensure severe complications of leptospirosis like hepatic & renal dysfunction.. Doxycycline is effective against both malaria and leptospirosis. So adding Doxycycline with Chloroquine or Quinine will be effective in treatment of both illness simultaneously. So treatment of both infections instead of malaria monotherapy will result in rapid recovery and avoid serious complications in endemic areas where both illnesses are common.

Discussion

To conclude, co- infection of Leptospirosis occurred in significant (22%) number of patients with Malaria in our study. In endemic areas of malaria and leptospirosis identifying and treating co-infection is essential for rapid recovery and to prevent complications. Chloroquine / Doxycycline or Quinine & Doxycycline (or Artemisinin group) / Penicillin combination is recommended for treatment of co-infection of leptospirosis and malaria. If diagnostic facilities for leptospirosis are not available it is beneficial to treat the co-infection by addition of Doxycycline to anti-malarial treatment. Modified Faine's Criteria can be utilized for diagnosis of current leptospirosis infection. This criterian is valuable only if diagnostic facilities for leptospirosis are available especially in co-infection. It is essential that a simple diagnostic tests for leptospirosis is made available in rural areas where both Malaria and Leptospirosis are commonly seen.

This is one of the few studies which have reported the largest number of Malaria and Leptospirosis co infection. This underscores the need to evaluate all patients who present with fever for Malaria and Leptospirosis co infection especially in endemic areas.

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Access to improved drinking water and sanitation facilities in a rural area of Bangalore urban district

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Abstract:

Introduction: Access to water supply and sanitation is a fundamental need and a human right. It is vital for the dignity and health of all people. **Objectives** To identify sources of drinking water to households in a village in Bangalore urban district and to assess access to improved drinking water and sanitation facilities among the households of the village. **Materials and Methods:** This is a descriptive study conducted between January 2010 and March 2010 in Mugalur village, Sarjapura Hobli, Anekal Taluk, Bangalore Urban District, Karnataka. This study includes 100 households and systematic random sampling technique was used to select these households. An interview schedule developed by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) in collaboration with experts from three international survey programmes – the Demographic and Health Survey (DHS), the Multiple Indicator Cluster Survey (MICS) and the World Health Survey (WHS) – as well with selected members of the JMP Technical Advisory Group (TAG) was modified and administered. **Results and conclusion:** This study found that majority of the households (85, 85%) utilize water from Bore well-A for drinking purposes. 34 (34%) households used Bore well-A, 34 (34%) Bore well-B, 12 (12%) Bore well-C, 9 (9%) Bore well-D and others used water from their own bore well for other domestic purposes. 69 (69%) households used some method of purification of drinking water and 5 (5%) households used packaged drinking water which was already purified. Out of the 100 households interviewed 72 (72%) had a toilet of which 62 (62%) had an improved sanitary toilet facility and 10 (10%) households had a shared sanitary toilet which was considered as unimproved sanitary toilet facility.

Key words: access, improved drinking water, sanitation

Introduction

Access to water supply and sanitation is a fundamental need and a human right. It is vital for the dignity and health of all people. The health and economic benefits of water supply and sanitation to households and humanity are known[1].

The health burden of poor water quality is enormous. It is estimated that around 37.7 million Indians are affected by waterborne diseases annually, 1.5 million children are estimated to die of diarrhoea alone and 73 million working days are lost due to waterborne disease each year[3]. The resulting economic burden is estimated at $600 million a year[3]. Even children's ability to learn is affected by water and sanitation problems as they end up spending more time off school than in school because of unsafe water and hygiene related ailments[3].

While accessing drinking water continues to be a problem, assuring that it is safe is a challenge by

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itself. Water quality problems are caused by pollution and over-exploitation. Individual practices also play an important role in determining the quality of water[3].

The provision of clean drinking water has been given priority in the Constitution of India, with Article 47 conferring the duty of providing clean drinking water and improving public health standards to the State. The government has undertaken various programmes since independence to provide safe drinking water to the rural masses[3].

"Access to improved water source" is defined as the percentage of population with access to an improved drinking water source in a given year[4]. "Access to improved sanitation" is defined as the percentage of population with access to improved sanitation in a given year[4]. Improved drinking water sources are defined in terms of the types of technology and levels of services that are more likely to provide safe water than unimproved technologies[4]. Improved water sources include household connections, public standpipes, bore wells, protected dug wells, protected springs, and rainwater collections[4]. Improved sanitation facilities are defined in terms of the types of technology and levels of services that are more likely to be sanitary than unimproved technologies. Improved sanitation includes connection to a public sewers, connection to septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines[4]. Not considered as improved sanitation are service or bucket latrines (where excreta is manually removed), public latrines and open latrines[4]. There is dearth of knowledge regarding access to safe water and sanitation facilities in developing countries especially in rural areas. This study aims to answer some basic questions pertaining to the drinking water practices and sanitation facilities in rural areas, and is based in a village in Bangalore urban district of rural Southern India.

Objectives

1.To identify sources of drinking water to households in a village in Bangalore urban district.

2.To assess access to improved drinking water and sanitation facilities among the households of the village.

Materials and Methods

This is a descriptive study conducted between January 2010 and March 2010 in Mugalur village, Sarjapura Hobli, Anekal Taluk, Bangalore Urban District, Karnataka. The sampling units were the households which were mapped and counted. Sample size was calculated based on the universal formula $n = z^2pq/d^2$ where in, z (at 95% confidence levels) = 1.96, p (access to safe drinking water in rural India)[5] = 0.85, q (1-p) = 0.15, Absolute precision (d) taken at 5% = 0.05. Using the above formula, the sample size calculated was 100. An interview schedule developed by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) in collaboration with experts from three international survey programmes – the Demographic and Health Survey (DHS), the Multiple Indicator Cluster Survey (MICS) and the World Health Survey (WHS) – as well with selected members of the JMP Technical Advisory Group (TAG) was modified and translated to the local language[2]. A pilot study was conducted and suitable changes were incorporated in the interview schedule. All the households in the village were numbered and a total of 239 houses were present in the village. A systematic random sampling technique was used and every 2.4^{th} house was interviewed to meet the required sample.

For practical purposes, following identification of the household in the sampling frame, the decimal point was ignored and only the whole number was considered for selecting the household. Informed consent was obtained from the households and the households which were found to be locked on 3 visits and those who did not give consent were excluded from the study. The interview schedule was administered to the senior most member of the family who was present at the time of the visit. Socioeconomic status of the families was assessed using 'standard of living index' (SLI)[6].

Results

Socio-demographic profile:

A total number of 100 households were interviewed. 50 (50%) of the families were nuclear families and 51 (51%) of families belonged to middle and 45 (45%) of families belonged to the upper socioeconomic class as assessed by the SLI.

Sources of water

Four common sources of drinking water supply were present in the form of four bore wells. For the purpose of this study they were named as Bore well-A, Bore well-B, Bore well-C and Bore well-D respectively. Majority of the households i.e. 85 (85%) utilize water from Bore well-A for drinking purposes as the water from other sources was reported to be 'hard'. Water is pumped into the storage tank and is made accessible to the households through a piped system. 34 (34%) households used Bore well-A, 34 (34%) Bore well-B, 12 (12%) Bore well-C, 9 (9%) Bore well-D and others used water from their own bore well for other domestic purposes.

Access to improved water facility

We found that the access to improved water facility was 100% as all the houses derived water from sources which were considered 'improved' according to the definition. 58 (58%) households collected water for drinking purpose from a public stand pipe, 24 (24%) from a tap present in the yard, 8 (8%) from a tap present in the house, 6 (6%) used packaged drinking water. 1 (1%) and 3 (3%) of the households used water from tube well and protected dug well respectively for drinking purpose (Table 1).

Table 1: Place of collection of drinking water

Place	No. of Houses	Percentage (%)
Piped water into dwelling	8	8.0
Piped water to yard/plot	24	24.0
Public tap/standpipe	58	58.0
Directly from Tube well/bore well	1	1.0
Protected dug well	3	3.0
Packaged drinking water	6	6.0
Total	**100**	**100.0**

Majority i.e. 90 (90%) households used a pot to transfer drinking water from the source to the household.

For other domestic purposes 43 (43%) households collected water from a tap present in the yard, 31 (31%) from a public stand pipe, 19 (19%) from a tap present in the house, 5 (5%) from a tube well and others collected from dug well and river directly. 81 (81%) households used a pot or bucket for its transfer while 19 (19%) drew water directly from a tap present inside the house.

Purification of water

69 (69%) households used some method of purification of drinking water and 5 (5%) households used packaged drinking water which was already purified out of which only 21 (21%) households practiced approved methods of purification. It was seen that majority i.e. 46 (66.7%) of them purified drinking water by straining it through a cloth. (Table 2)

Table 2: Method of purification of drinking water

Method of purification	No. of Houses	Percentage (%)
Boiling	1	1.4
Roll boiling	6	8.1
Strain it through a cloth	46	62.1
Water filter	8	10.8
Tea strainer	6	8.1
Aqua guard	2	2.7
Packaged drinking water	5	6.8
Total	**74**	**100.0**

Access to sanitation facilities

Out of the 100 households interviewed 72 (72%) had a toilet of which 62 (62%) had an improved sanitary toilet facility and 10 (10%) households had a shared sanitary toilet which was considered as unimproved sanitary toilet facility. Only 6 (6%) of the toilets were situated inside the house whereas a majority i.e. 56 (56%) of the toilets were situated outside the house.. 69 (69%) households disposed the faeces of children less than 3years old into the open field, 10% into the open drain and only 21 (21%) households disposed the faeces in the sanitary toilet.

Discussion

This study mainly tries to answer the objectives of finding the source of drinking water supply and also the assessment of access to improved water supply and sanitation in a village in a rural area of Bangalore urban district. We found that the access to improved water facility was 100% as all the houses derived water from source which were considered 'improved' according to our definition as compared to 84.5% access in rural India[5] and 82% globally[1]. The improvement in the access to improved water supply can be adjudged by the fact that in rural India there were 11.8% of houses who had piped water in the dwelling /yard/plot, as compared to this study wherein 32% of the houses had piped water supply in the dwelling /yard/plot[5].

The improvement in the access to drinking water supply can be attributed to various factors among which the initiatives by the village Panchayat are very important. Bore wells are the main source of water supply to the village households in rural India [5] and the Panchayat in this village has created bore wells for the village with pipe lines for the easy accessibility. The responsibility for collecting water was mostly with the adult woman of the family (87%) which was comparable to findings reported from other studies in rural India (82.7%) and pot (58%) was the most common mode of transfer or storage of water within the house[5].

The lack of safe drinking water creates a tremendous burden of diarrheal diseases and other debilitating life threatening illnesses for people in the developing world[1]. Keeping this in mind we also included the purification of water at the household level in this survey and it was found that 26% of houses do not use any method of purification. However, it is still better than the findings reported from other studies in rural India where 72.7% did not use any method of purification[5]. The other aspect of this study was to assess the access to sanitary toilet by the people. Sanitary facilities interrupt the transmission of faeco-oral disease at its most important source by preventing the contamination of water and soil by human faeces.[1] Therefore equal importance was given to the access to sanitary facilities in our survey and it was found that 62% of houses possessed a sanitary toilet as compared to 17.6% houses in rural India[5.] Yet the number of houses having a sanitary toilet within the house infrastructure was found to be as low as 6%. This can be attributed to the belief of the people that toilet was an unhygienic place to be present within the house and also an active source of spread of germs. Children are the main victims of diarrhoea and other faeco-oral diseases and compared to the faeces of an adult, children's faeces are also a more likely source of infection[1]. However, most often children are neither encouraged or coaxed to use a toilet, nor is due importance given for safe disposal of their feces. It was found that 69% of houses practiced open air defecation and 10% passed stools into open drains adjacent to their houses. The reasons for this indifferent attitude of parents towards children come from the fact that many communities consider faeces of children as harmless.

Conclusion

All the households in the village studied had access to safe and improved water supply as compared to 88% in rural India and 82% globally. 62% of the households had improved sanitary toilet facility of which 56% of them were situated outside the house.

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Knowledge about Cervical Cancer Risk Factors among the Rural Women of Kancheepuram District, Tamil Nadu

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Abstract:

Introduction: Cancer of the cervix is the second most common cancer in women worldwide, with about 500 000 new cases and 250 000 deaths each year. Cancer of the cervix has been one of the most important cancer in women in India over the past two decades. **Objectives:** To assess the knowledge about cervical cancer risk factors among the rural women and to identify the misconceptions about cervical cancer among them. **Materials and Methods:** It is an interview based cross sectional study conducted with 192 women aged 30 years and above. Survey questionnaire consists of three components such as socio-demographic details, knowledge of risk factor assessment and misconceptions assessment. All the data were analyzed by using SPSS. **Results:** 80 (41.7%) are aged between 46 and 50 years. Majority of women in this study belongs to Hindu (93.8%) religion. Also 145 (75.5%) of women are low monthly income group and 163 (84.9) are currently married. In each category of risk factors knowledge, there is significant number of women who either responded with "no or do not know". There are several misconceptions among the women who participated in this study, especially about the screening for cervical cancer. **Discussion:** This study found that there are several rural women who are not aware about the risk factors of cervical cancer such as increasing age, Infection with HPV, starting early sexual life, multiparity, smoking, use of Diethylstilbestreol. **Recommendation:** More health education about risk factors and screening program could be the integral part of health care delivery systems

Introduction:

Cervical cancer is one of the leading causes of morbidity and mortality amongst the gynaecological cancers worldwide[1] and in today's world, cervical cancer is primarily a disease found in low income countries[2]. Cancer of the cervix has been the one of the most important cancer in women in India over the past two decades.

All the urban Population Based Cancer Registries at Bangalore, Bhopal, Chennai, Delhi and Mumbai have shown a statistically significant decrease in incidence rates of this site of cancer. Since over 70 per cent of the Indian population resides in the rural areas, cancer cervix still constitutes the number one cancer in either sex[3].

The usual 10–20-year natural history of progression from mild dysplasia to carcinoma makes cervical cancer a relatively easily preventable disease and provides the rationale for screening. Most women who develop cervical cancer tend to have one or more identifiable factors that increase their risk for the disease. It is uncommon but not impossible for

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women to develop cervical cancer without any of these risk factors. Some risk factors can be changed (such as smoking and diet) while others cannot be changed (such as age and race). Also, there are several misconceptions about cervical cancer and its screening program. Attitudes and beliefs about cervical cancer among the general population and health care providers can also present barriers to its control. Hence, assessing the knowledge of risk factors and misconceptions about cervical cancer will provide us an opportunity to prevent as well as cure at its early stage one of the deadliest cancer of women.

Objectives:

1. To assess the knowledge about cervical cancer risk factors among the rural women and

2. To identify the misconceptions about cervical cancer among them.

Materials and Method:

Study Design:

It's an interview based, cross sectional study and was conducted among the rural women from Kancheepuram district from October 2008 to March 2009. A total of 192 women participated in this study. Inclusion criteria: The women aged 30 years and above.

Survey questionnaire:

It has three components firstly, *socio-demographic details* of the study population (Age, Education, Religion, Income, Parity, Marital status), secondly, *knowledge about risk factors of cervical cancer* (formulated with the help of available literature on relevant topic[4, 5]), thirdly, *misconception about cervical cancer* assessment (based on "Comprehensive Cervical Cancer Control: A guide to essential practice[6]).

All the data were entered twice (double entry) and analyzed by using Statistical Package for Social Sciences (SPSS).

Results:

A total number 192 women aged 30 years and above were interviewed. Out of 192 subjects, 80 (41.7%) are aged between 46 and 50 years. Majority of women in this study belongs to Hindu (93.8%) religion. Also 145 (75.5%) of women are low monthly income group and 163 (84.9) are currently married (Table 1)

Table 1: Socio-demographic profile
(N = 192)

Variables	Number	%
Age (in years)		
30 - 45	62	32.3
46 - 60	80	41.7
> 60	50	20
Educational status		
Illiterate	53	27.6
Literate (upto HSC)	92	47.9
Literate (Above HSC)	47	24.5
Religion		
Hindu	180	93.8
Christian	5	2.6
Muslim	7	3.6
Monthly family income		
Low	145	75.5
High	47	24.5
Marital status		
Married	163	84.9
Others (Widowed, Single, Etc)	29	15.1
Parity		
0	6	3.1
1 - 3	115	59.9
≥ 4	71	37

Knowledge about cervical cancer risk factors among the study subjects are given in Table 2.

In each category of risk factors knowledge, there is significant number of women who either responded with no or do not know: Increasing age (no - 57.3% and do not know - 12.5%), Infection with Human Papilloma Virus (no - 12% and do not know – 54.1%), early sexual life (no – 75.5% and do not know – 15.1%), Multiparity (no - 83.3% and do not know – 4.2%), Smoking (no – 13.5% and do not know – 6.3%) and Diethylstilbessterol (no - 12% and do not know – 17.1%)

Table: 2 Knowledge of cervical cancer risk factors
(N = 192)

Risk factors category	Number	%
Increasing age		
Yes	58	30.2
No	110	57.3
Don't' know	24	12.5
Infection with HPV		
Yes	65	33.9
No	23	12
Don't' know	104	54.1
Starting of sexual life at early age (Less than 18 year)		
Yes	18	9.4
No	145	75.5
Don't' know	29	15.1
Multiparity* (≥ 3)		
Yes	24	12.5
No	160	83.3
Don't' know	8	4.2
Smoking		
Yes	154	80.2
No	26	13.5
Don't' know	12	6.3
DES **		
Yes	17	8.9
No	23	12
Don't' know	152	79.1
Multiple sexual partners		
Yes	113	58.8
No	18	9.4
Don't' know	61	31.8

Table 3: Misconceptions about cervical cancer
(N = 192)

Misconception	Number	%
Intrautrine (IUDs) device causes cervical cancer	68	35.4
In screening, part of your body is removed.	112	58.3
Screening is like a vaccine: once you have had it, you will not get cervical cancer	92	47.9
There is no point in going for cancer screening, because it only tells a woman that she has a fatal condition and nothing can be done for it.	121	63
Cervical cancer is seen in women with poor hygiene practices.	45	23.4
Use of tampons and herbs can cause cancer of the cervix.	58	30.2

An attempt was made to assess the misconceptions about cervical cancer among the women and the same is presented in Table 3. It shows that huge number of women have misconceptions, especially about screening program for cervical cancer.

Discussion:

This study found that there are several rural women who are not aware about the risk factors of cervical cancer such as increasing age, Infection with HPV, starting early sexual life, multiparity, smoking, use of Diethylstilbestreol and having multiple sexual partners. This findings about knowledge of risk factors are slightly similar to et al[7]. In contrast to our study, the study done by Varen A et al[4] found that awareness about the risk factors is more among their study group. This contrast may be due to the fact that the latter study was conducted among the educated group.

There are several misconceptions among the women who participated in this study. Especially about the screening programs such as *"In screening, part of body is removed, Screening is like a vaccine: once you have had it, you will not get cervical cancer and There is no point in going for cancer screening, because it only tells a woman that she has a fatal condition and nothing can be done for it".*

Recommendations:

In order to increase the knowledge of risk factors of cervical cancer, there is need for more cervical cancer screening awareness program in rural areas.

More health education about cervical cancer could be made an integral part of different levels of health care systems in India. This may help to increase the knowledge of risk factors as well as remove the misconceptions about it.

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Millennium Development Goals (MDGs) WATCH-Countdown to 2015; Measuring progress towards the MDGs

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Countdown to 2015: 3 years and 9 months

The indicators for MDG are developed by assessing several criteria for international comparison. However it is very difficult to countries would rely on these prescribed indicators. Hence some of the indicators are replaced, deleted and added according to national information system[1]. By these ways indicators were developed for international comparison on MDG achievement. Advanced statistical methods used to compile regional and world wide data compilation and comparision[3].

The indicators were selected by the following 5 indicators[2]:

1. Provide relevant and robust measures of progress towards the targets of the Millennium Development Goals

2. Be clear and straightforward to interpret and provide a basis for international comparison

3. Be broadly consistent with other global lists and avoid imposing an unnecessary burden on country teams, Governments and other partners

4. Be based to the greatest extent possible on international standards, recommendations and best practices

5. Be constructed from well-established data sources, be quantifiable and be consistent to enable measurement over time

Country data were used for compiling the indicators where such data are available and of reasonable quality. The data source for each indicator and the quantitative value of the indicator were decided by consensus among the key stakeholders, especially the national statistical system. The national statistical system should own the data and related indicators.

The following factors related to each indicator used in MDG:

_ A simple operational definition
_ The goal and target it addresses
_ The rationale for use of the indicator
_ The method of computation
_ Sources of data
_ References, including relevant international Web sites
_ Periodicity of measurement
_ Gender and disaggregation issues
_ Limitations of the indicator
_ National and international agencies involved in the collection, compilation or dissemination of the data.

The Asia-Pacific region has registered impressive progress on many Millennium Development Goal (MDG) indicators, but is still lagging on some important targets, particularly those related to health[3]. The table 1., highlights significant differences between sub regions of MDG progress.

South Asia started from a low base on many indicators. Although it has made good progress on nine of them but is progressing only slowly on many others. Given the population weight of India it is also useful to consider 'South Asia without India'. As can be seen, this grouping is on track for poverty and for TB incidence is an early achiever, but is progressing slowly on the provision of clean water, and is regressing on forest cover. The total number of Asia-Pacific people who remain deprived is detailed for 10 indicators in Table 2

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Table 1.Regional tracking of MDG

Goal	1		2			3			4		5			6			7						
	$1.25 per day poverty	Underweight children	Primary enrolment	Reaching last grade	Primary completion	Gender primary	Gender secondary	Gender tertiary	Under-5 mortality	Infant mortality	Maternal mortality	Skilled birth attendance	Antenatal care (≥ 1 visit)	HIV prevalence	TB incidence	TB prevalence	Forest cover	Protected area	CO_2 emissions	ODP substance consumption	Safe drinking water	Basic sanitation
Asia-Pacific	●	■	▶	■	■	●	●	●	■	■	■	■	■	●	●	●	●	●	◀	●	●	■
Excluding China and India	●	▶	■	■	■	●	●	●	■	■	■	■	■	●	●	●	◀	●	◀	●	▶	■
South-East Asia	●	▶	▶	■	●	●	●	●	■	■	■	■	■	●	●	●	◀	●	◀	●	▶	▶
South Asia	■	■	▶	■	■	●	▶	■	■	■	■	■	■	●	◀	●	●	●	◀	●	●	■
Excluding India	▶	■	■	■	■	▶	■	■	■	■	■	■	■	●	●	●	◀	●	◀	●	■	■
Pacific Islands					■	◀		▶	■	■	■	◀	■	●	●	◀	◀	●	●	●	◀	◀
Excluding Papua New Guinea			■		◀	●	●	●	■	■	■	◀			●	●	●	●	◀	●	■	■
North and Central Asia	■		◀	●	●	●	●	●	■	■	■	●		●	●	●	●	●	◀	◀	■	■
Excluding Russian Federation	■	●	◀	●	●	●	●	●	■	■	■	●	●	●	●	●	●	●	◀	◀	■	■
Asia-Pacific LDCs	■	■	■	■	■	●	●	◀	■	■	■	■	■	●	●	●	◀	●	◀	●	■	■
Asia-Pacific Low Income	■	▶	■	■	■	●	●	■	■	■	■	■	■	●	●	●	◀	●	◀	●	■	■
Asia-Pacific Middle Income	●	■	▶	■	▶	●	●	●	■	■	■	■	■	●	●	●	●	●	◀	●	●	■

Table-2. Country wise progress on MDG

Goal		1		2			3			4		5			6			7						
		$1.25 per day poverty	Underweight children	Primary enrolment	Reaching last grade	Primary completion	Gender primary	Gender secondary	Gender tertiary	Under-5 mortality	Infant mortality	Maternal mortality	Skilled birth attendance	Antenatal care (≥ 1 visit)	HIV prevalence	TB incidence	TB prevalence	Forest cover	Protected area	CO2 emissions	ODP substance consumption	Safe drinking water
South & South-West Asia	Afghanistan		▶				■	◀	◀	■	■	■	■	■		▶	●	▶	▶	◀	●	▶
	Bangladesh	■	▶	◀	■	◀	●	●	■	▶	▶	■	■	■	▶	▶	●	◀	●	●	●	■
	Bhutan		■	■	■	▶	●	●	■	▶	■	●	▶	▶	◀	●	●	●	●	◀	●	■
	India	■	■	●	■	▶	●	▶	■	■	■	■	■	■	●	▶	●	●	●	◀	●	●
	Iran (Islamic Rep. of)	●	▶	●	▶	●	●	●	●	▶	■	●	●	●	◀	●	●	▶	●	◀	●	■
	Maldives	●	▶	●		●	●	●		●	●	●	■	●	▶	●	●	▶	▶	◀	●	■
	Nepal	■	■		■	■	▶	▶	■	▶	■	■	■	■	●	▶	◀	◀	●	●	●	●
	Pakistan	●	■	■	◀	■	▶	▶	■	■	■	■	■	■	◀	▶	●	◀	▶	◀	●	■
	Sri Lanka	●	◀	●	●	●	●	●		■	■	■	●	●	▶	▶	●	◀	●	◀	●	●
	Turkey	◀	●	■	▶	■	●	▶	■	●	●	▶	■	▶	▶	●	●	●	●	◀	●	●

India has managed to show significant progress in 10 of the 22 indicators. With impressive gains in improving primary education enrollment rate, promoting gender equality and increasing forest cover, the country's lackluster performance in reducing overall poverty and health indicators has dragged down the performance of the overall South Asian region.

The data used was from the ESCAP database for the MDG indicators for Asia and the Pacific supplemented with data on governance indicators on government and control of corruption from the Worldwide Governance Indicators produced by the Brookings Institution, World Bank Development Economics Research Group, and the World Bank Institute; and infrastructure indicators from the World Development Indicators online database and the World Energy Outlook 2010 of the International Energy Agency. Cross country data was pooled with time series for the above regional reports.

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