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Editorial

NATIONAL PROGRAMME FOR PREVENTION & CONTROL OF DEAFNESS (NPPCD)

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MAGNITUDE OF DEAFNESS/ HEARING IMPAIRMENT

Hearing impairment is one of the most common problems in human society. Over 5% of the world's population – 360 million people – has disabling hearing loss (328 million adults and 32 million children). Disabling hearing loss refers to hearing loss greater than 40dB in the better hearing ear in adults and a hearing loss greater than 30dB in the better hearing ear in children. The majority of these people live in low- and middle-income countries.[(1)] It is the second most common cause of disability. India has a large population of hearing impairment with approximately 63 million people are suffering from hearing impairment amounting to 6.3% of Indian population.[(2)] Approximately 25,000 deaf children are added to the country's population every year.[(3)] Even though, the condition is not fatal but the implication at individual, family and community level leading to loss of physical and economic productivity is considerable. Hearing impairment may have a profound effect on the ability of individuals to communicate with others, on their education, on their ability to obtain and keep employment, and on social relationships and may lead to stigmatization. [(4)]

National Sample Survey(NSS) 2002 showed hearing loss was the second most disability after locomotors and it accounts for 9% of all disabilities in the urban and 10% of in the rural areas.[(5)] WHO survey have listed the common causes for hearing loss and ear disease in India as ear wax (15%), ageing and presbyacusis (10.3%), middle ear infections CSOM(Chronic suppurative otitis media (5.2%) and serous otitis media (3%), perforation of tympanic membrane (0.5%) and bilateral genetic and congenital deafness(0.2%). Nearly 50% of them are preventable and about 30% are treatable. [(6)]

This large magnitude of the problem indicates the need to have an effective method to prevent the onset of hearing loss. Recognizing the need and based on the principles of sound hearing, Government of India initiated a pilot project for the prevention and control of hearing loss in the country. Pilot project was started in 2007 based on the concept of healthy ear district. In the initial phase, this project was started in 25 districts over 11 states across the country. The Programme has been expanded to 192 districts of 20 States/UTs. The programme has also been integrated with the National Rural Health Mission (NRHM) under the Ministry of Health & Family Welfare, Govt. of India. In the 12th Plan, it is proposed to expand the Programme to additional 200 districts in a phased manner probably covering all the States and Union territories by March, 2017.

Short term objectives [7]

1. To prevent the avoidable hearing loss on account of disease or injury.
2. Early identification, diagnosis and treatment of ear problems responsible for hearing loss and deafness.
3. To medically rehabilitate persons of all age groups, suffering with deafness.
4. To strengthen the existing inter-sectoral linkages for continuity of the rehabilitation programme, for persons with deafness.
5. To develop institutional capacity for ear care services by providing support for equipment, material and training personnel.

Long term objectives[7]

To prevent and control major causes of hearing impairment and deafness, so as to reduce the total disease burden by 25% of the existing burden by the end of eleventh five year plan.

EXPECTED BENEFITS OF THE PROGRAMME

The Programme is expected to generate the following benefits:-

1. Availability of various services like prevention, early identification, treatment, referral, rehabilitation etc. for hearing impairment and deafness as the primary health center (PHC) /community health centers (CHC) / district hospitals largely cater to their need.
2. Decrease in the magnitude of hearing impaired persons.
3. Decrease in the severity/ extent of ear morbidity or hearing impairment.
4. Improved service network/referral system for the persons with ear morbidity/hearing impairment.
5. Awareness creation among the health workers/grass root level workers through the PHC medical officers and district health officers, which will percolate to the lower level health workers functioning within the community.
6. Capacity building at the district hospitals to ensure better care.

STRATEGIES:

- To strengthen the service delivery including rehabilitation.
- To develop human resource for ear care.
- To promote outreach activities and public awareness through appropriate and effective IEC strategies with special emphasis on prevention of deafness.
- To develop institutional capacity of the district hospitals, CHC and PHC, selected under the project

I. CAPACITY BUILDING AND MANPOWER DEVELOPMENT

Manpower training and development: This program included seven tiers of interactive training program from the state level to the village level. Under NPPCD all the health care personals from district level to grass root level will be oriented in prevention, promotion, early identification and rehabilitation of all types of ear diseases leading to deafness. Under this program the Sensitization and Awareness of the doctors and Audiologists at the Medical College level will be carried out by the resource person from central coordination committee. The coordinator at state medical college will train the ENT surgeon and Audiologists at the District level for 5 days who will be the nodal persons for coordinating the ear and hearing care activities in the district on the skill up gradation and re-orientation. Micro-ear surgeries pertaining to deafness correction including Myringoplasty,Tympanoplasty, Stapedectomy and Mastoidectomy will be covered in this period.¨ Reorientation of diagnostic and therapeutic skills will be done for the Audiologists/ audiometricians. In addition Pediatricians and /Obstetricians at district hospital level and CHC level will be sensitized on the causes of deafness and the importance and techniques of early identification of hearing loss amongst the newborns. Training program will be conducted to sensitize the doctors at the PHC and CHC, doctors under the School Health Scheme and doctors working in various industrial units in the district on the preventable causes of deafness and reorientation in early diagnosis and treatment of common ear diseases and skill building with regard to use of otoscope and diagnosis management of common ear diseases. In order to

strengthen primary ear care needs grass roots workers namely Public Health Nurses, Multi Purpose Workers male and female, Anganwadi Supervisors and Child Development Project Officers, ASHAs and TBAs will be sensitized by the PHC/CHC doctors/RCI Rehabilitation Professionals. These workers will identify deafness at an early age and also create awareness in the community on the prevention of hearing loss and timely care. Training of the Primary School teachers and Parents of Hearing/Speech impaired children at the village level will be conducted by the PHC doctors, trained under the programme and locally available Rehabilitative Professionals in Hearing Impairment. The funds for the programme are given to the state health society and programme committee of NRHM to carryout various activities through district health societies. District health society and programme committee are expected to prepare a micro-plan on an ongoing basis and operationalization of the programme.

Capacity building: In order to improve the infrastructure required for screening of ear morbidity and detection of hearing loss a budget of Rs 20,000/ kit for PHC and Rs50,000/kit for CHC will be provided. At district level a budget of Rs 20 lakhs per district will be provided to equip district hospitals for the management of ear problems and deafness cases which are referred from lower level. The state medical college with existing audiological and ENT set up will act as tertiary referral centre.

II. SERVICE PROVISION INCLUDING REHABILITATION

The service components under NPPCD include early detection, ear screening camps, treatment of medical and surgical conditions, appropriate referral, rehabilitation of hearing and speech disorders and hearing aid provision and awareness creation in the community.

Early case detection: All personnel from grass root level including family members/parents, selected school teachers, MPWs at sub-centre level, Public Health Nurses & medical officers in PHCs and CHCs and district level will be sensitized on the importance of early detection of hearing impairment. All the personnel at different levels will be assigned specific task so that, the right guidance is provided timely to the affected persons in the community. For early detection of cases of hearing Impairment and deafness, house to house surveys will be conducted by the AWWs & ASHAs, under the supervision of the male and female MPWs. The deafness cases will be recorded in the disability ANM's village register. School teachers will undertake to screen the children in the school with the help of pre-prepared proformas. These will help to identify children with any ear or hearing problem. They will then be referred to the School Health doctor for evaluation, diagnosis and guidance regarding treatment. The District level Pediatricians and Gynecologists will be responsible for referring any child born of a high risk pregnancy or delivery, as well as other children who are exposed to a high risk factor in infancy and who show features suggestive of hearing impairment. These children will be screened by the district level ENT doctor / Audiologist with OAE and then subjected to diagnostic tests.

Community Screening Camps: Screening camps will be organized at community level in collaboration with NRHM or identified NGO at the PHC/CHC and District level for spreading awareness, screening the general population in respect of ear problems, hearing impairment and their treatment and referral of such cases in case of need. In addition parents will be educated regarding importance of right feeding practices, various common ear problems, early detection of deafness in young children and available treatment for hearing impairment/deafness. Panchayat members, members of Mahila Mandals and Youth leaders will be educated on the importance of early detection and treatment of ear problems. One screening camp will be organized per month at any PHC or CHC or District hospital by rotation.

School screening camp: Each year, all children attending the Primary section of the schools in the districts will be screened for the presence of Ear & Hearing diseases. Those children, who are positive for ear and hearing diseases should then be subjected to the clinical screening. The clinical screening should be carried out by the School doctor under the school health scheme, by the PHC Doctor

Role of NGOs in screening camps: **T**o have an interface with the community and the people for any disease control activities NGOs having better reach

at the grass root level will assist in the activities of deafness prevention and control. Based on the eligibility criteria The State Nodal Agency (SNA) under NPPCD will identify organizations involuntary sector that have facilities for Health / Rehabilitative services preferably Hearing / speech related services. The NGO will implement the activities by means of organizing of camps at periodic intervals in a well-defined geographical area according to the guidelines for conducting screening camp. The camps will be held at PHC / CHC / District hospital level in every district twice a month.

Early diagnosis and management: Treatment of all affected persons would be undertaken at the following levels: Public Health Nurses and MPWs: would provide treatment of common ear ailments such as Wax, Acute Suppurative Otitis Media etc. under the guidance of the PHC doctor. The Public Health Nurses &MPWs will have the capacity to distribute relevant ear drops and medicines under the guidance of the PHC doctor. Trained PHC/CHC doctors will provide early diagnosis of ear diseases and treatment of all common ear ailments. All persons requiring special diagnostic facilities, complicated cases and those needing surgical intervention will be referred to the District hospital.

Referral services: Effective linkages would be developed from peripheral level to district level with the help of functionaries and personnel from grass root level (AWW, ASHA and sensitized parents and PRIs), sub-centre level (Male and female MPWs), PHC level medical officers, Public health nurses, School teachers and School health doctors, ENT private practitioners and District level officers.

Rehabilitation and Hearing Aid provision: All patients who are identified as having an ear problem that either requires surgery, hearing aid fitting or rehabilitative therapy will be referred to the ENT doctor and Audiologist at the district level. Those who need surgery will be given the appropriate treatment at the district hospital. Complicated cases that cannot be adequately handled at the District hospital will be further referred to the State Medical College for expert treatment. Patients who suffer with Sensorineural hearing loss that is not amenable to medical or surgical correction and which requires hearing aid, will be fitted with the same at the district level which will be provided by Ministry of Social Justice &Empowerment.

III. AWARENESS GENERATION THROUHH IEC ACTIVITIES

Awareness Creation among Parents/ community**:** Community level health workers and doctors will undertake this activity on a continuous basis. This will also form a part of the IEC activities at various levels. Sensitization will be done regarding various aspects relating to early detection of hearing loss. They will be educated about the various ill effects of hearing loss on the speech, mental and social development of the child.¨ Information regarding various treatment modalities as well as techniques of rehabilitation. Sensitization to ill effects of hearing loss in the elderly so that they may refer the aged hearing impaired persons for suitable management/rehabilitation.

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IV. MONITORING AND EVALUATION

Monitoring and supervision: Monitoring tools have been developed for all levels. Indicators have been developed to supervise the performance of the districts in deafness prevention and control. Monthly reports are to be generated citing progress and submitted to higher levels and the report to be submitted every month to programme nodal officer. On-site concurrent evaluations will also be done to provide periodic supportive supervision. Feedback will be regularly sought from allied organizations.

CONCLUSION

The secondary and tertiary levels of the health system provide graded specialized care for hearing impairment and ear diseases. With a sound networking of referral system from primary care to tertiary care for patient with ear disease and hearing impairment and referring back for a good follow up care for ensuring continuity of care will inspire confidence of the system. This will enhance the community participation at large. Availability of such a system of referral is of paramount importance, ensuring the access of the needy population to specialized ENT staff at the higher levels and of their services. If the strategies included in the NPPCD implemented with political will and strong leadership, will decrease the magnitude of ear problems and prevent avoidable deafness in India.

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Short Article

Prevalence of surgical conditions among rural population of Southern Karnataka, India

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Abstract

Introduction: Surgical care is increasingly recognised as an important component contributing to global health, yet data for the burden of surgical disease are scarce. Even after half a century of independence, not more than 20% of the population have any access to basic surgical services. **Objectives:** To assess the prevalence of common surgical conditions and factors associated among people residing in Mugalur Subcentre, Anekal taluk, Bangalore. **Materials and Methods:** This was a cross-sectional study conducted among 500 individuals aged between 18-70 years using two-staged stratified random sampling technique in 9 villages under Mugalur Subcentre, rural Karnataka. **Results:** Of the 500 study subjects 239 (47.8%) were males. Majority (59.2%) were in the age group between 21- 40 years and 111(22.2%) had no formal education. Also 155(30.9%) were belonging to class III SES, 54(10.8%) are alcoholics, while 52(10.4%) are smokers. Prevalence of surgical conditions was found to be 34(6.8%). Most common surgical illness were swelling 14(2.8%), ulcer 11(2.2%) followed by haemorrhoids, hernia, varicose veins and breast lump. There was no statistically significant association found prevalence of surgical conditions with age, gender and occupation. We found that among the people who had surgical conditions majority of them seek surgical care from Government hospitals. **Conclusion:** Prevalence of common surgical conditions was 6.8%, with no significant associations. To create awareness about the common surgical conditions among the people and to help them seek treatment from hospital

Key words: prevalence, surgical conditions, rural Karnataka, India.

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Introduction:

Surgery is an essential component of health care system but has generally been neglected within global public health. Surgical conditions are defined as ''any treatment that includes suture, incision, excision, manipulation, or other invasive procedure that usually, but not always, requires local, regional, or general anaesthesia".[i]Surgical conditions are diverse and occur in every phase of the life-cycle. Recent figures show that not more than 20% of the population have any access to basic surgical services. (National Human Development Report 2013).[ii]This situation can be improved only if there is adequate number of rural surgeons in India where surgery is affordable and available near the patient's residence.

Need for the study: Surgical care is increasingly recognised as an important component contributing to global health, yet data for the burden of surgical disease especially in rural areas is scarce.[iii]To explore the necessity of surgical services in a

primary care setting and to improve the health services for the surgical needs.

Objectives: To assess the prevalence of common surgical conditions among people residing in Mugalur subcentre, Anekal taluk, Bangalore&To identify the factors associated with these surgical conditions.

Methodology:

A cross sectional study was conducted among adults aged above 18 years residing in 9 villages under Mugalur Subcentre, Sarjapur PHC, Anekal Taluk, Bangalore District during March to April 2015. Sample size was calculated to be 456 (500).We used two-staged stratified random sampling technique in 9 villages under Mugalur Subcentre, rural Karnataka.List of all people aged >18yrs was collected from the Health Management and Information System (HMIS) data, Proportion of sample allocated to each village was determined. Each village stratum was divided into 6 strata based on the age distribution Proportionate number of samples was then randomly selected by lottery method.The common surgical conditions assessed in the study were swelling, ulcer, piles, hernia, varicose vein, abscess, cellulitis, PVD and breast lump. Adults thus enlisted, were interviewed after taking consent.

People in the age group of 18-70 years who are residents of 9 villages of Mugalur sub-center area for more than 1 year were included and seriously ill or bedridden and not able to give information excluded.Sample Size(n) = **234**;Considering non response rate of 10%, sample size was calculated to be 256.

This study was approved by the Institutional Ethical Committee. After establishing rapport with the participants, the purpose and procedure of the study was explained. Informed written consent was obtained from the participants and the interview schedule was administered to the participants.

Statistics and analysis of the data:

The data was entered and coded in Microsoft Excel and analysed using SPSS version 16 for proportions, frequencies and associations. Measures of central tendency, dispersion and chi square tests were used to analyse data. We considered p value of less than 0.05 as significant. When more than 20% of cells in tables had value less than 5, then we considered Fisher's exact test for significance.

Results:

Table1:Details of medical illness and habits

Variable	Category	No	%
Habits	Alcohol	54	10.8
	Smoking	52	10.4
	Chewable tobacco	41	8.2
Medical illness	Hypertension	16	3.2
	Diabetes	32	6.4
	Both	25	5
Surgical condition	Present	34	6.8
	Absent	466	93.2

Table 2: Gender Specific Prevalence of surgical conditions

GENDER	MALE	FEMALE
SWELLING	**8(1.6%)**	**6(1.2%)**
ULCER	5(1.0%)	**6(1.2%)**
PILES	2(0.4%)	3(0.6%)
HERNIA	1(0.2%)	0
VARICOSE	0	1(0.2%)
ABSCESS	0	1(0.2%)
CELLULITIS	0	0
PVD	0	0
BREAST LUMP	0	1(0.2%)

Of the 500 study subjects 239 (47.8%) were males. Majority (59.2%) were in the age group between 21-40 years and 111(22.2%) had no formal education. Also Majority of them were in class II & III socio economic class (modified BG Prasad), while 53% belonged to nuclear family. Major occupation was agriculture (33.8%) and also majority of the population (35%) were housewives. Smoking and alcohol was found to be in 10.4% and 10.4% of the individuals while 6.4% &3.2% had history of diabetes and hypertension

Surgical conditions were noted only in 6.8% of clients (Table 1) and swellings and ulcers were predominant in both sex(Table 2)

Discussion:

Prevalence of common surgical conditions in the Mugalur subcentre, rural area of Southern Karnataka was found to be 6.8% and there are no comparison studies to correlate with this prevalence of common surgical conditions while there are some studies on common surgical procedures.[iv]Most common surgical illness were swelling 14(2.8%), ulcer 11(2.2%) followed by haemorrhoids, hernia, varicose veins and breast lump. This result is in line with the common surgical conditions seen in the peripheries. Age and gender specific prevalence is given in table 3 and 4, where swelling is common in the age group of 21-40 years in males, ulcer in 31-40 years which is common in females. This also depends on the individuals interviewed and the surgical conditions they are aware of. Factors like age, gender and occupation were not found to be associated with these surgical problems. We found that among those who had surgical conditions majority of them sought surgical care from Govt hospitals (Vani Vilas) followed by a private hospital at Sarjapur.

Conclusion:Prevalence of common surgical conditions was 6.8%, with no significant associations. The study results will help to know the common surgical conditions in the rural areas and the services we need to provide. Also we can create awareness about the common surgical conditions among the people and to help them seek treatment from hospital.

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Conflict of interest: Nil

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Original Research Article

A study on perception of illness among Bronchial asthma patients

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Abstract

Introduction: Bronchial asthma is a major chronic illness and its prevalence is increasing. The control of the symptoms of asthma is related to the perception of its symptoms. *Methodology:* A descriptive study was conducted in a tertiary care hospital for a period of 3 months. 130 patients with bronchial asthma, selected by purposive sampling were interviewed using the standard Illness Perception Questionnaire – Revised (IPQ - R). *Results:* 42 (32.30%) were males and 88 (67.70%) females met the inclusion criteria. The mean age of study subjects was 35.75±15.89 years. 124 (95.38%) subjects experienced breathlessness and 120 (92.30%) experienced wheezing; however, only 62(47.69%) and 84 (64.61%) subjects respectively, related these symptoms to asthma. Possible causes of asthma according to the study subjects were pollution (113, 86.92%), diet (96, 73.85%), poor medical care in the past (50, 38.46%), hereditary (48, 36.92%) and stress/worry (41, 31.54%). *Conclusion:* Patients with bronchial asthma patients have poor perception of their illness.

Key words: Bronchial asthma, Illness perception, Asthma control, Asthma management

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Introduction

The World Health Organization (WHO) has estimated that 300 million people around the world suffer from asthma.[1, 2] It is a major public health problem worldwide. The prevalence of asthma is increasing both in developed and developing countries. Bronchial asthma is a chronic inflammatory disorder of the airways characterized by cough, breathlessness, wheezing and chest tightness.[3] In most of patients, symptoms can be controlled with medication. However, compliance with these medications is a major problem in asthma management. The control of asthma symptoms in a patient is related to the perception of their symptoms.

Illness Perception Questionnaire (IPQ) is a new method to assess the cognitive representation of illness which in turn determines the ability of a patient to cope with his/her illness. [4] Poor perception and understanding of symptoms is related to poor compliance with treatment and thus frequent exacerbations of symptoms, leading to near death or even death in some cases.[5, 6] Only few

studies have been conducted in India in relation to illness perception among patients with bronchial asthma. This study was therefore conducted with the aim of assessing the perception of illness among patients with bronchial asthma patients.

Materials and Methods

It was a descriptive study was conducted in a tertiary care hospital for a period of 3 months following approval from the Institutional ethics committee. The sample size of 130 was calculated based on the assumption that the prevalence of bronchial asthma is 9% (as determined in previous studies), with a precision of 5 %.. Patients aged 18-65 years, attending the outpatient clinic of the Department of Respiratory Medicine, with an established diagnosis of mild to moderate persistent bronchial asthma (GINA Guidelines), and consenting to participation in the study, were included. Seriously ill patients were excluded from the study. Purposive sampling was employed to obtain the appropriate sample. Standard Illness Perception Questionnaire – Revised (IPQ-R) developed by Weinman.J et.al [7] was administered to all the study subjects. Information regarding baseline characteristics and each patient's views about their illness and the possible causes of asthma were collected by the trained investigator in the local language. SPSS version 16.0 was used for data entry and analysis. Descriptive statistics were used.

Results

There were 42 (32.30%) males and 88 (67.70%) females. Majority of the subjects were aged between 21-30 years (34, 26.15%). The mean age of the study subjects was 35.75 ±15.89 yrs (Mean ±SD). Majority of patients i.e. 40 (30.77%) have had studied up to primary/middle school and 44 (33.84%) were unskilled workers. **(Table 1).**

It was observed that 124 (95.38%) subjects experienced breathlessness but only 62 (47.69%) of these related this symptom with asthma. 120 subjects (92.30%) experienced wheezing but only 84 (64.61%) of these attributed this symptom to asthma. 118 (90.76 %) of subjects experienced cough but only 66 (50.76 %) related this to asthma.

The possible causes of asthma according to the study subjects were pollution (113 subjects, 86.92%), diet (96 subjects, 73.85%), poor medical care in the past (50 subjects, 38.46%), hereditary (48 subjects, 36.92%) and stress/worry (41 subjects, 31.54%). (**Table 2).**

Table 1: Basic Demographic profile of study subjects

Parameters		Number	Percentage
Sex	Male	42	32.30
	Female	88	67.70
Mean Age (yrs) ± SD		35.75 ±15.89	
Education	Primary/middle school	40	30.77
Occupation	Unskilled	44	33.84

Table – 2: Distribution of study subjects according to possible causes of asthma (N=130)

Possible causes	Number*	Percentages
Pollution	113	86.92
Diet	96	73.85
Poor medical care in the past	50	38.46
Hereditary	48	36.92
Stress/worry	41	31.54
Ageing	20	15.38
Alcohol	11	8.46
Smoking	15	11.54

*Multiple responses

It was observed that 72 (55.38%) expected to have their asthma for the rest of the life, 48 (36.92%) believe that asthma is a serious condition, 62 subjects (56.36%) expected to suffer from the disease for the remainder of their lifetime, 83 patients (63.84 %) were of the opinion that the disease had serious financial consequences, 88 (67.70%) believed that asthma seriously affects quality of life, 112 patients (86.15%) reported a feeling of depression when they thought about their disease. Only 52 (40.76%) believed that they can

control their asthma symptoms with available medications. 98 (75.38%) feels that they will become addicted to inhalers if take long time, 80 (61.53%) believe that asthma medications have side effects and 112 (86.15%) thinks they are suffering from asthma only when they have symptoms.**(Table 3).**

Table – 3 : Distribution of study subjects according to their views about Asthma (N=130)

Patients views about their	Agree*	Percentage
I expect to have this asthma for the rest of my life	72	55.38
My asthma is a serious condition	48	36.92
My asthma has serious financial consequences	83	63.84
My asthma seriously affects my quality of life	88	67.70
I can control my asthma	52	40.76
I get depressed when I think about	112	86.15
My treatment can cause side effects	80	61.53
I can cure my asthma with available medications	47	36.15
I become addicted to medications	98	75.38
I am suffering from my asthma only when I have symptoms	112	86.15

*Multiple responses

Discussion

The success of the treatment of asthma is dependent upon the compliance of the patient to treatment, which in turn depends upon the patient's perception of asthma symptoms. In this study 47.69% of subjects attributed their symptom of breathlessness to asthma. Similarly, 64.61 % of subjects and 50.76% of subjects, related wheezing and cough respectively to asthma. Alberto Cukier observed that patients with bronchial asthma patients can be classified as either "under perceivers" or "over perceivers", with more importance being given to "under perceivers" owing to the possibility of an increased risk of hospitalization and morbidity in this group due to postponement of treatment.[8] Studies by ID Bijil-Hofland et.al and Cathy Hermann et.al also concluded that poor perception of asthma symptoms, as was observed in their studies was directly related to asthma attacks and its complications.[9,10]

In our study, majority of subjects believed that pollution (86.92%), diet (73.85%), and poor medication in the past (38.46%) are possible causes of asthma. These findings are similar to those in a study conducted by R Prasad et al in India, who observed that a majority of the patients had wrong concepts about the disease aetiology, disease management, inhalation therapy and the prognosis of asthma. It was observed that 86.15% of our subjects believed that they have asthma only when they are symptomatic. Asthma is a chronic inflammatory disease, the absence symptoms of which, does not imply the absence of disease, thereby necessitating follow up examination at frequent intervals and long term medication. Treatment only during symptomatic periods may lead to complications and frequent exacerbations in subsequent years.[11] A study by Johannes C et al conducted in Leiden, Netherlands also concluded that poor perception of the symptoms of asthma was observed in patients with severe asthma along with sputum eosinophilia.[6]

In our study, it was observed that 89.09 % of patients wanted a permanent cure for their disease, 75.38% believed that they would become addicted to the medication if taken on a long term basis and 61.53% believed that the asthma medications had side effects. All these perceptual factors may lead to poor compliance with medication and therefore increased mortality and morbidity due to asthma in later life. In a study conducted by Rakhee Sodhi et.al in India, it was observed that 62.14% believed that asthma could be permanently cured and had tried an alternate system of medicine.[12]

In conclusion, it was observed in this study patients with bronchial asthma have poor perception of their illness and its symptoms. Appropriate timely health education is needed to improve compliance to asthma management.

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Original Research Article

Prevalence of Tobacco Use in an Urban Slum Population in Kochi, Kerala

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Abstract

Background: Tobacco consumption is the primary cause of preventable morbidity and mortality in developing countries. **Objectives:** To determine the prevalence of tobacco smoking and to assess the knowledge and attitude of tobacco usage among a selected urban slum population of Kochi, Kerala. **Materials and Methods:** A community based cross sectional study done was done in a selected urban adult population of Kochi city. 212 individuals were interviewed. Data were collected using a pretested semi-structured questionnaire adapted from Global Adult Tobacco Survey (GATS). Data was tabulated using Microsoft Excel and analyzed using SPSS version 20. **Results:** Of the 212 people interviewed, 61.3% were males; the prevalence of smoking in the general population was found to be 16.5%. Among the smokers, 77% of had the interest to quit smoking. Awareness regarding tobacco use and its ill effects was 78.8% in the study population. Among the factors associated with tobacco use, education below higher secondary was associated with smoking status [OR 2.56 (1.24-5.26), p 0.01]. **Conclusion:** Despite a reasonable awareness among the study participants, 16.5% of the people were smokers. Constant support through cessation clinics and programmes to 77% of the current smokers who were interested to quit smoking, might bring down the rates further. Efforts are needed at the same time, to prevent people from initiating smoking.

Keywords: Tobacco smoking, prevalence, urban slum, awareness

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INTRODUCTION:

Tobacco consumption is the primary cause of preventable morbidity and mortality in developing countries. World Health Organization (WHO) reports that the point estimate for tobacco smoking among persons aged 15 years and above would be 9.3% by the year 2020 in India.[1] In India tobacco use continues to grow steadily at 2-3% per year and it is predicted that by 2020 tobacco use will be responsible for 13% of all deaths in the country.[1-3]

Each year in India, tobacco use results in about 160,000 cases of cancer, 4.5million heart diseases and 3.5million chronic obstructive lung diseases.[3,4] Smoking is responsible for a large number of premature deaths in India and majority of these occur in the prime working age group of 15–59 years.[3-5]

Estimated prevalence of tobacco use in Kerala, the southern Indian state in 2005 was 4 million while the 2009-'10 GATS report shows the prevalence as 21.4% (7 million).[6,7] The cost for tobacco related cardiovascular diseases, cancer, tuberculosis and

respiratory diseases amounted to Rs 5.4 trillion in Kerala in 2011.[6]

The Government of India has become increasingly engaged with the country's tobacco problem over recent years.[7,8] The more comprehensive Cigarette and Other Tobacco Products Act (addressing tobacco use in public places, tobacco advertising, and sale and packaging regulations) was introduced in 2003, and the Framework Convention on Tobacco Control brought into force in 2005.[9] In 2008, Government of India adopted legislations for banning smoking in public places.[10] The Government of Kerala has also incorporated tobacco control in its non communicable disease control program. State government kept on increasing the value added tax on cigarettes every year.[11]In all developing countries including India, people living in slum areas have poor standard of living, low levels of education and high levels of poverty. Poverty itself is a risk factor for poor health status. Studies published have shown the slum dwelling people to have higher rates of tobacco usage[12]. Since the poor and uneducated have higher chances of tobacco usage, the current study was undertaken to assess the prevalence of tobacco smoking in an urban slum population of Kochi, Kerala and to study the knowledge and attitude of tobacco usage among them. Findings from this study may help policymakers and program managers to know the effects of recent tobacco control interventions and to plan further strategies.

MATERIALS AND METHODS:

The Corporation of Cochin is the largest municipal corporation in Kerala both in area and population. This is the second most important port city in the western coast of India and is the commercial capital of the State. There are 231 slums in Kochi city. The number of households in each slums ranged between 30 to 200. The total households in all the slums were estimated as 12,949 with a total population of 60678 which constitutes nearly 11% of population of the City. More than one third of the slum dwellers were below poverty line. Community medicine department of Amrita Institute of Medical Sciences is providing primary care to an urban population of around 25,000 including a slum through its urban health centre.

A community based cross sectional study was conducted in May 2015 among the residents of an urban slum, Manapattiparambu. All residents who have been staying in the area for more than 6 months, and aged above 18 years were included. Sample size was calculated based on the prevalence of tobacco use in Kerala according to the District Level Household Survey[13] which was 37.6%. With 95% confidence and 20% allowable error the sample size was estimated to be 212. [12]Manappaattiparambu area had 8 avenues; first house was randomly selected from each avenue, then by Systematic random sampling every 5th house was visited.

The structured interviewer administered questionnaire had questions adapted from Global Adult Tobacco Survey (GATS). Never smoker was defined as those who never smoked a cigarette in his / her entire life; Former/ ex- smoker was defined as those who had smoked cigarettes before, but had quit smoking & Current smoker was defined as those who were currently smoking. The definitions used were similar to those used in GATS.[1]

Data were tabulated using Microsoft Excel and analyzed by Statistical Package for Social Sciences Version 20. Descriptive statistics including frequency and percentages were done. Association of the various factors with the tobacco usage behavior was checked using Chi – square test.

RESULTS

Of the 212 study participants, 61% were males and 39% were females; with mean age of 42.9± 16years. The socio demographic features of the study population have been described in Table 1.

The prevalence of tobacco use in the study population was found to be 16.5% (95% CI 11.8-22.1). All the persons identified as tobacco users in the study were tobacco smokers. No person using smokeless tobacco were found in the present study. The prevalence of current tobacco use among males was 27%. 96% of the ever users used cigarettes and 38% of them started using tobacco products before the age of 18years. Among the current tobacco users, 40% used 2-5cigarettes/day, 57% smoked at workplace, 71% had smoked daily in the last week. Among the current smokers, 37% of them spent more than Rs 1000 in the previous month to

purchase tobacco products and 77% of them had the interest to quit smoking, while 48% of ever users had been advised to quit smoking by health workers.(Table 2)

Table1. Socio demographic Characteristics of the study population (N=212)

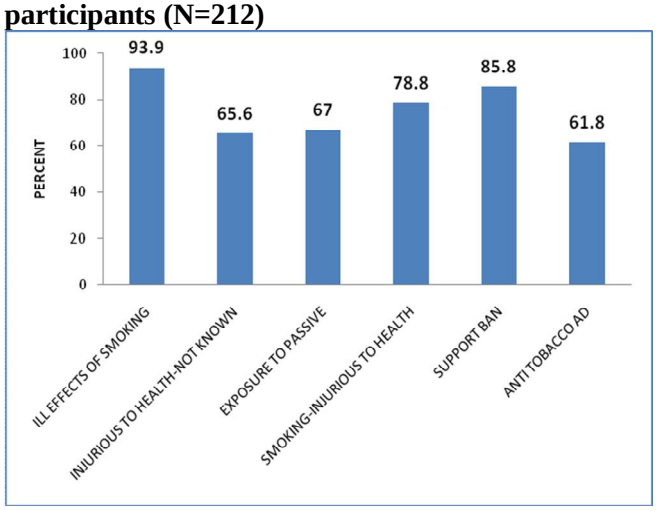
Characteristics	Categories	Frequency (%)
Age Group	<20 years	10 (4.7)
	21-40 years	100 (47.2)
	41-60 years	72 (34)
	>60 years	30 (14.2)
Gender	Male	130 (61.3)
	Female	82 (38.7)
Educational Status	Illiterate	5 (2.4)
	Primary (1-4 standard)	10 (4.7)
	Upper Primary (5-7 standard)	24 (11.3)
	High school (8-10 standard)	58 (27.4)
	Higher secondary	46 (21.7)
	Degree/higher	69 (32.5)
Occupation	Unemployed	16 (7.5)
	Homemaker	60 (28.3)
	Unskilled	24 (11.3)
	Semi skilled	20 (9.4)
	Skilled	47 (22.2)
	Professional	27 (12.7)
	Retired	18 (8.5)

Table 2. Details of smoking habits among the study participants

Characteristics	Categories	Frequency (%)
Smoking status(N=212)	Never smoked	160 (75.5)
	Ex Smoker	17 (8)
	Current Smoker	35 (16.5)
Type of tobacco products used(N=52)	Bidi	2 (3.8)
	Cigarettes	50 (96.2)
Age of Onset of smoking(N=52)	< 12 years	2 (3.8)
	13-15 years	7 (13.5)
	16-18 years	11 (21.2)
	>18 years	32 (61.5)
Factors responsible for initiation(N=52)	For happiness	21 (40.4)
	Difficulties in Life	2 (3.8)
	Peer Pressure	11 (21.2)
	To imitate others	3 (5.7)
	Others	15 (28.8)
Number of cigarettes smoked in last 7 days (N=52)	0	2 (5.7)
	<7 per week	2 (5.7)
	1-5 cigarettes daily	21 (60
	5-10 cigarettes daily	5 (11.4)
	>10 cigarettes daily	6 (17.1)
Money spent on cigarettes/bidis In last 30 days (N=52)	Nil	2 (5.7)
	< Rs 100	3 (8.6)
	Rs 101-1000	17 (48.5)
	Rs 1001-3000	5 (14.3)
	>Rs 3000	8 (22.8)

The findings related to knowledge and attitude of participants are presented in figure 2. Among the study participants 95% were aware that sale of tobacco products near a school is illegal; 97% had knowledge that the sale of tobacco products to a child less than 18years was illegal and 80% of them have noticed the warning signs on the packet of tobacco products. Bivariate analysis was done between tobacco use and demographic factors such as age categories, religion,educational status and occupational status.Among the factors associated with tobacco use, education below higher secondary was associated with smoking status [OR 2.56 (1.24-5.26), p 0.01].

Fig 1. Knowledge and attitude of study participants (N=212)



DISCUSSION:

Despite rising advertisements and commercials to spread public awareness about adverse effects of `Tobacco, 2015 saw over 1.1 billion people smoke tobacco and among the tobacco users, staggering 121 million live in India.[1]

The current study was done among 212 residents of an urban slum in Kochi and the prevalence of tobacco use was 16.5%. The finding was lower than that reported in Kerala, as well as a study done by Chockalingam et al in Chennai. [14] In the GATS survey, the prevalence of tobacco use in any form among adults was 34.6% and among them 14% were current tobacco smokers.[4] There were no smokeless tobacco users in the present study. The prevalence of tobacco use among males in an urban slum of Hyderabad by Gupta et al was 48.3%, slightly higher than the findings from the current study.[15] The prevalence of tobacco use among males in the current study was found to be 40% which is similar to the findings from the Centre for Cardio metabolic

Risk Reduction in South Asia (CARRS Delhi) study,[16]while the GATS survey noted that 47.9% of the tobacco users were males. The study done by Jindal et al in Bangalore, Chandigarh, Delhi and Kanpur showed a lower prevalence of ever smokers than the current study where the prevalence of ever smokers among the study participants was 24.5%.[17]

Cigarette was the most common tobacco product used in the current study, 96%; which is higher than the studies done in urban, semi urban and rural areas of Chennai (77%) by Chockalingam et al and studies done in Karachi (21%). [14,16] The exposure to passive smoking in this study was found to be 67%, which is lower than the findings of WHO in India while higher than the findings by Chockalingam et al in Chennai[4,14] The GATS survey found the exposure to second hand smoke to be 52.3% at home and 29% at public places which is lower when compared to the present study[4].In our study population, 61.2% had noticed an anti tobacco advertisement in the radio, television , newspaper or movies which is slightly less when compared to the 72% urban adults who noticed the same according to GATS [4] .The current study showed a significant association between lower education and male tobacco use which is similar to the findings from the CARRS study.[16] A study done by Thankappan[6] et al in Kerala also revealed higher tobacco use among less educated people.[18]

Studies done in Thiruvananthapuram district of Kerala reports a major improvement in the awareness regarding health effects of tobacco.[19,20] Our findings on a reasonable awareness about harmful effects of tobacco are consistent with findings from other studies done in the state.[19,20]

Kerala is an advanced State in terms of epidemiological transition leading to increasing chronic diseases such as cardiovascular diseases, various forms of cancer, diabetes and chronic obstructive pulmonary disease. Tobacco use is considered to be the major modifiable risk factor for such chronic diseases.[21] Therefore, tobacco control and cessation are an important public health priority in the State. Since tobacco use has been reported to be higher among the poor and less educated people, both disease burden as well as economic burden due to tobacco use will disproportionately affect them.

The current study points out that despite these efforts and in spite of its high literacy and better health-care systems, tobacco problem still exists in the community. The study was conducted in one slum of the district and therefore cannot be generalized. The study relied on self-reporting by the subjects, and hence, both underreporting and over reporting might be possible. Despite these limitations, the study findings underscore the urgent need for increased efforts to implement the strategies to reduce smoking and thereby to prevent its harmful health effects.

CONCLUSION:

Awareness regarding tobacco use and its ill effects was reasonable in the study population. However, the high awareness has not stopped 16.5% of the population from smoking. Constant support through cessation clinics and programmes to 77% of the current smokers who were interested to quit smoking, might bring down the rates further. Efforts are needed at the same time, to prevent people from initiating smoking.

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DECLARATIONS

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Conflict of interest: the authors have no conflict of interest to declare.

Ethical approval: the study was done in accordance with the guidelines by the declaration of Helsinki.

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Original Research Article

A study to assess the knowledge and belief of female towards breast cancer and its screening practices in Hyderabad, India

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Abstract

Background: Cancer affects all communities world wide, approximately 14 million new cases and 8 million deaths were there in 2012. Breast cancer is by far the most common cancer among women. Most of the victim turn up for medical intervention at advanced stage when survival rate is low. Commonest reason for late reporting is lack of awareness about risk factor, symptoms and early detection methods of breast cancer.**Objectives:** To assess the knowledge and belief of female towards breast cancer.**Methodology:** A hospital based study was carried out at Deccan College of Medical sciences, Hyderabad during the period of August 2013 to October 2013. Women age 20 or more attending Obstetric and Gynecology OPD of Owaisi hospital during study period were included in study. A pretested structured questioner was used to collect the needed information from respondents. Data was entered in MS excel, and analyzed and presented by frequency table. **Results:** Total 179 women were participated in study. Most of them (83.2%) were aware of breast cancer and agree that risk of breast cancer increase with high fat diet, early menarche, oral contraceptive use and radiation exposure. Only 48% of participants were aware that test to detect breast cancer is available and only 20% had knowledge about breast self examination and only 4% practice it. **Conclusion:** It is concluded that though awareness regarding breast cancer was good but there was poor knowledge and practice about screening test.

Key Words: Breast Cancer, Breast Self Examination, Breast Screening, Clinical Breast Examination, Mammography

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Introduction

Cancer is a leading cause of morbidity and mortality globally, with approximately 14 million new cases and 8 million cancer related deaths in 2012 which constitute 13% of total deaths worldwide.[1-2] Cancer is a major public health problem in India also with over 1 million new cases and approximately 7.8 lakh deaths per year contributing 7.8% global cancer burden and 8.3% global cancer death.[1] Breast cancer is most common cancer in both developed as well as developing countries among women with an estimated 1.67 million cases diagnosed in 2012 (794000 in developed and 883000 in developing region). This accounts to 25% of all cancers with incidence rate of 27 per lakh in Eastern Africa to 98 per lakh in Western Europe. In India also prevalence of breast cancer is increasing as there were 115251 cases with incidence rate of 23 per lakh population in 2008 to 144937 cases in 2012 with incidence rate of 27 per lakh population.[3] According to National Cancer Registry (2012-14), breast cancer was the most common cancer among Indian women.[4] Main risk factors for breast cancer are early menarche, late menopause, family history, high fat diet, oral contraceptives and radiations.

Most of the victims seek medical intervention at advance stages of breast cancer. This is because of lack of knowledge and awareness regarding breast cancer and it's screening.[5] Early breast cancer constitute only 30% of the cases seen at different cancer center in India whereas in developed world 60-70% of cases seek medical intervention at early stages.[6] If breast cancer patients present in 3rd and 4th stage the outcome is not as good as earlier stage.[7]

Assisted detection [FNAC, mammography, clinical breast examination, and self breast examination] increases chances of early detection of tumor, and tumor free survival duration and decrease recurrence rate.[8]American Cancer Society guidelines suggest some measure for early detection of breast cancer like, 1) Breast Self Examination for women starting their twenties, 2) Clinical Breast Examination about every three years for the women in their twenties and thirties and every year for women at age forty and above and also 3) yearly Mammography at the age of forty.[9]

Aim of primary prevention of breast cancer should be to eliminate risk factors hence promotion of breast cancer education is important intervention. As breast cancer is not a topic freely discussed in India because of culture and taboos, there is an urgent need to create awareness and information about breast cancer and its early detection. Keeping in mind, the increasing incidence of breast cancer and importance of screening to control it, a study was undertaken to assess the knowledge regarding breast cancer among women.

Materials and Methods

A cross sectional hospital based study was carried out at Deccan College of Medical sciences, Hyderabad during the period of August 2013 to October 2013. Ethical clearance was taken from institutional ethical committee. Women age 20 or more attending Obstetric and Gynecology OPD of Owaisi hospital were included in study. We had selected 180 women by quota sampling. As large number of women attending Obstetric and Gynecology OPD we choose systemic random sampling to draw the sample. Every 10th patients fulfilling our inclusion criteria were selected. Informed consent was taken from participants. A pretested structured questioner was used to collect the needed information from the respondents. Information collected was knowledge and attitude regarding breast cancer, it's risk factors, screening methods and available treatment. Out of 180 selected cases, study questioner of one participant was dropped out in scrutiny, hence total 179 women were finalized as participants. Data was entered in MS excel and analyzed and presented by frequency table.

Results

In this study 179 women were participated. In the study population 66% were in age group of 20-29 years and 74% belongs to upper middle class, 87% were married. Around 83% women were aware of breast cancer and 64% know that it is non infectious disease. About 68.8% said that breast cancer is common among married women without children. Regarding the risk factor of breast cancer, 65% women believes that risk of breast cancer increase with high fat diet, 55% said early menarche is a risk factor, oral contraceptive use is also a risk factor believed by 61% women while 52% women believed radiation exposure as risk factor but only 33% agreed that breast cancer risk increases with positive family history. About 63% of participants agree that breast feeding decreases the risk of breast cancer. Only 48% of study populations were aware that test to detect breast cancer is available and 66% said that breast cancer is curable if detected at early stage. (table 1) Regarding breast self examination, 20% had knowledge but only 4% practice it.

Table 1: Knowledge of women regarding breast cancer (N = 179)

Variables	Yes	No	Don't know
Aware of breast cancer	149 (83.2%)	30 (16.8%)	0
Breast cancer is infectious	27 (15%)	115 (64.2%)	37 (20.8%)
Common among married women without children	123 (68.8%)	56 (31.2%)	0
Menarche below 10 years increase the risk	99 (55.3%)	80 (44.7%)	0
Family history increase the risk	59 (33%)	86 (48%)	34 (19%)
High fat diet increases the risk	117 (65.3%)	17 (9.5%)	45 (25.2%)
OCP increase the risk	110 (61.45%)	11 (6.1%)	58 (32.4%)
Breast feeding decrease the risk	113 (63.1%)	26 (14.5%)	40 (22.4%)
Radiation increase the risk	94 (52.5%)	55 (30.7%)	30 (16.8%)
Testing available	86 (48%)	59 (33%)	34 (19%)
Curable in early stage	118 (66%)	24 (13.4%)	37 (20.6%)

Discussions

Breast cancer is one of the preventable cancer and survival rate is directly related to the stage at diagnosis and treatment. In India, women seek medical care at the advance stages when mortality rate is high. Several reasons for late reporting have been found, of which lack of awareness, poor health seeking behavior and shyness on part of patients are major ones. There is misconception regarding breast cancer in India also like breast cancer means losing one's breast, trauma will cause breast cancer and breast cancer is a communicable disease. [10] Present study was undertaken to assess the knowledge and belief about breast cancer and its screening practices in an attempt to break the barrier and spread the awareness about early detection and treatment of breast cancer and hence reduce it mortality. In this study 179 women were participated. Majority of study population were in age group of 20-29 years and belongs to upper middle class and most of them were married. In present study we found that most of the women (83%) were aware of breast cancer. Similar result of high awareness about breast cancer was also reported from a study in Mumbai by Shinde[10] (80%), Punjab by Shehrawat[11] (81%), Jharkhand by Kumar (75%),[12] while in studies in Delhi by Somsatta [5] and Dey S[13] awareness was low i.e. 56% and 53% respectively.

Most of women in this study agreed that risk of breast cancer increase with high fat diet, early menarche, oral contraceptive use and radiation exposure, which was in concordance with Shehrawat study[11] but only 33% agreed that breast cancer risk increases with positive family history. In Kumar study majority (53%) said that positive family history is main risk factor for breast cancer and only 27% said high fat diet is risk factor. [12] In a study by Al Junaibi in Oman also found that family history was most widely (86%) known risk factor.[14] Majority of participants agree that breast feeding decreases the risk of breast cancer. Similar result also found in study by shehrawat[11], but study by Shinde found that very few respondents believed that breast feeding is a protective factor.[10] In this study we found that only half of study populations were aware of the test to detect breast cancer and 2/3rd said that breast cancer is curable if detected at early stage. Shehrawat[11] also found that nearly half of the women aware of screening test and 2/3 rd were aware of treatment available. In kumar study 57% women said breast cancer is not curable.[12]

Breast Self Examination (BSE) is an appropriate screening test for breast cancer and practicing BSE can reduce the mortality by early detection of breast cancer. The present study showed that knowledge and practice of BSE were very low, only 20% had knowledge and only 4% practice BSE. Similar finding of very low knowledge and practice of BSE were also reported in many studies.[10-12,15,16] Many studies from different part of country also found that planned teaching and education programme can improve the knowledge and skill of women towards breast cancer and early detection by different screening test. [17-19] Health care providers can play an important role in disseminating this knowledge to the community. The teaching of BSE can help women to be alert to any abnormal changes in their breasts and seek medical advice immediately.

Conclusion: In conclusion, this study had shown that though awareness regarding breast cancer was good but there was poor knowledge about risk factors and screening test. Breast self examination which is most sensitive and cost effective method for early detection of cancer was known by few women and very few of them practice it regularly. Therefore it is important to educate the women about breast cancer and its risk factors, eliminate the misconception and promote screening for early detection.

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Original Research Article

A study on Traditional Beliefs and Practices in Newborn Care among Women Attending UHTC, NMC, Nellore A.P

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Abstract

Background: All people urban or rural have their own beliefs and practices concerning health and disease. Cultural factors are deeply involved in health and sickness. Some customs and beliefs have positive values while others may be useless or positively harmful. Some of these cultural factors have stood in the way of implementing health programmes. This study aims to find out among the women attending outpatient department of urban health training centre of Narayana Medical College, Nellore. **METHODOLOGY**: This cross sectional study was done after obtaining permission from institutional ethical committee in female patients aged 18-70 years attending UHTC, NMC from Oct 2016- Dec 2016, over a period of 3 months. A total of 180 female patients were interviewed using predesigned, pretested questionnaire. Data was entered in MS EXCEL & analyzed by SPSS version 22. **Results:** Most of the study participants are literates. 50% belongs to 25 years age group.78% of the participants were working. Majority of them (61.6%) belong to nuclear families. 36% of participants were initiated breast feeding within half an hour. 77.8% of participants were given prelacteal feeds to the newborn. The cultural practices and beliefs regarding bath revealed that highest percentage 79.4% of the mothers massaged the baby with oil before bath. 51.7% of the mothers gave home remedies for digestion. None of mothers applied ashes or soot or cow dung on the umbilical cord of the baby. **Conclusion and Recommendations:** A lot of beliefs were observed in this study which needs to be educated to the population.

Key words: traditional beliefs and practices, Newborn

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INTRODUCTION:

All people urban or rural have their own beliefs and practices concerning health and disease. Cultural factors are deeply involved in health and sickness. Some customs and beliefs have positive values while others may be useless or positively harmful[1]. Some of these cultural factors have stood in the way of implementing health programmes. These practices which are followed may affect the health of newborn and plays an important role in physical, psychological and social development in children[2]. The child rearing practices has a profound influence on the health of growing children. The transfer of civilization including culture, beliefs, traditional practices etc from parents to children make the children into promising citizens of tomorrow[2]. A child who is breastfed has grater chances of survival than artificial fed child[1].

AIMS & OBJECTIVES: To find out traditional beliefs and cultural practices among the women attending to OPD of UHTC, NMC, Nellore.

METHODOLOGY:

This community cross sectional study was done after obtaining permission from institutional ethical committee. The study was conducted in UHTC, Saraswathi Nagar, field practice area of Narayana Medical College, Nellore during Oct 2016- Dec 2016 over a period of 3 months. This study was done in all female patients aged 18-70 years attending OPD of UHTC after obtaining their consent. A total of 180 female patients were interviewed using predesigned, pretested semi structured questionnaire. Data was entered in MS EXCEL & analyzed by SPSS version 22.0.

RESULTS:

Among 180 participants the results are as follows: Majority of the participants (78.3%) belong to Hindus. 45.6% of participants belong to BC category. Most of them (61.6%) belong to nuclear families. Table 1 shows the demographic profile of study participants.

Table 1: socio demographic characteristics (n=180)

Demographic variable	Frequency	Percentage
Age		
<20years	9	5
20-35years	96	53.3
36-50years	41	22.8
51-65years	20	11.1
>65years	14	7.8
Education		
Professional	2	1.1
Graduate	36	20
Inter	50	27.8
High school	40	22.2
Middle school	5	2.8
Primary school	16	8.9
Illiterate	31	17.2
Occupation		
Housewife	141	78.3
Working	39	21.7
SES (modified BG Prasad's **)**		
I	24	13.3
II	59	32.8
III	51	28.3
IV	36	20
V	10	5.6

Majority of the participants 143 (79.4%) were in the habit of massaging the baby with oil before bath. 93 (51.7%) were using turmeric paste and herbal powder during bath. Some of the participants, 40 (22.2%) did not give bath immediately after feeding; they were thinking that it may cause aspiration of milk. Most of the participants, 149 (82.8%) had practice of exposing the baby over "dhoopam" smoke after bath. 63 (35%) of participants delayed first bath to the baby up to 24 hours.

The cultural practices and beliefs regarding feeding revealed that, majority of the participants, 155 (86.1%) were practicing burping of infants. 93 (51.7%) gave home remedies for digestion. 67 (37.2%) had the used hot water to evacuate stools. Table 2: shows the cultural practices and beliefs regarding feeding.

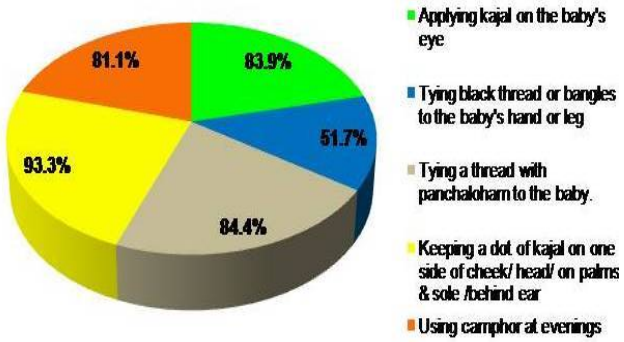
Table 2: cultural practices and beliefs regarding feeding

S.no	Variable	Frequency	Percentage
1	**Initiation of breast feeding**		
	<1/2 hour	65	36.1
	Within 4 -6 hours	84	46.7
	>24 hours	31	17.3
2	Giving pre lacteal feeds soon after birth	122	77.8
3	Discarding the colostrums	38	21.1

Table 3: Other Cultural Practices and Beliefs Related To Newborn Care

S no	Variable	Frequency	Percentage
1	Removing coated tongue by using masikaya (herb) / turmeric / cloth	159	88.3
2	I accept "empty cradle should not be moved".	102	56.7
3	I accept "Baby's cloth should not be placed outside at night".	108	60
4	Baby is not allowed to be taken out after 6 pm.	100	55.6
5	Blowing air into nose & ears to clear mucous	99	55

Figure 1. Cultural practices and beliefs to prevent Evil Eye.



The cultural practices and beliefs related to umbilical cord care revealed that, 148 (82.2%)

participants were applied antiseptic powder to umbilical cord. 62 (34.4%) had practice of applying heat to umbilical cord to make it dry. Only some people 12 (6.7%) had applied ashes/ soot/ cow dung to umbilical cord. 3 (1.7%) had applied turmeric powder to umbilical cord.

Cultural practices in disposal of fallen umbilical cord: 77 (42.8%) of them buried the cord, 54 (30%) hid the cord in their homes, 8 (4.4%) kept cord in amulets, 38 (21.1%) had given cord to others, 41 (22.8%) had mixed practices in fallen umbilical cord. Figure 1: shows the cultural practices and beliefs to prevent evil eye.

The cultural practices regarding care during jaundice revealed that 143 (79.4%) had practice of exposing the baby to sunlight when the newborn had jaundice.106 (60.6%) had practice of taking baby to hospital. 25 (13.9%) had practice of exposing the baby to sunlight.16 (14.4%) had practiced skin branding & leaf extracts (pasaru) to newborn in case of jaundice. Table 3: shows the other cultural practices and beliefs related to newborn care.

There is significant association between educational status and giving prelacteal feeds to newborn (χ^2 =58.902, p <0.001), educational status and baby should not be taken out after 6 PM (χ^2 =24.006, p <0.000), educational status and baby clothes should not be placed outside at nights (χ^2 =30.294, p <0.000).

DISCUSSION:

In our study 79.4% of participants used oil massage before bath, which is similar to study conducted by Reshma[3] et al in Mangalore taluk. 52% of participants in our study used herbal powder/ turmeric for bathing baby, which is similar to a FGD conducted by Sanghamitra Pati[4] in Odisha and Leena Shankar JL[5] et al., in Trivendrum. Certain traditional practices like oil bath with turmeric and other ingredients possessing a beautifying effect, is a healthy habit.[2]

Our study showed that 37.2% of participants used hot water to evacuate stools, where as it is 32% in a study conducted by Reshma[3] et al in Mangalore taluk. Though this practice is not recommended, some people are still using this in newborn care, these needs to be educated. 52% of participants tried remedies for home digestion, which is nearer i.e, 53% to a study conducted by Reshma[3] et al in Mangalore taluk. This harmful practice sometimes may lead to diarrheal diseases in newborn

Our study showed 77.8% were given prelacteal feeds to new born, which is not at all a good practice, where as it is 62% in a study conducted by Leena Shankar et al[5], 80% in Sangamitra pati[4] giving prelacteal feeds like honey, sugar water etc. are strictly prohibited because not only they introduce infection but also they replace colostrum & interfere with sucking.

21% of participants discarded colostrums in present study, where as it is 16% in reshma etal[2] and it is 10% study conducted by Canturk Capik [6]et al in Turkey, 43%in a study conducted by Saadia Gul et al[9]. 13% in Latika Nath Sinha[10] Our study showed that many (21%) of participants were discarding colostrum. This shows that they had less knowledge regarding importance of colostrum like high concentration of proteins & other nutrients, anti infective properties which protect the baby against respiratory & diarrheal diseases[1]. This needs attention of health personnel in our field practice area and planning for programmes to educate the mothers about importance of colostrum.

36% initiated breast feeding within half an hour in our study. Breast feeding to be initiated within half an hour of birth, because newborn is very active during first hour of life & therefore reflexes are strong. Early initiation ensures that the baby gets colostrum positively[2].

A study conducted by Leena Sankar JL[5] in Trivendrum showed that 98% of participants practiced burping, where as in our study 86% of participants practiced burping. Burping helps let out of swallowed air, and also helps to prevent from evening colic.

82.2% of participants used antiseptic powder for cord care, where as it is 46% in Canturk Capik[6] study. 56.5% used turmeric powder in Avadhesh Kumar[8] study, but in our study it was 1.7%. 22%

had the practice of giving fallen cord to others, with a belief that, if that cord was ingested by the couple who do not have children, they will have a child in future (as a remedy for infertility). 4.4% had the belief that fallen umbilical cord if kept in amulets so that this will help the child from ghosts & evil spirits.

Our study showed 79% of individuals had the practice of exposure to sunlight in jaundice where as it is 73% in a study conducted by Reshma[3] et al. This practice helps in decreasing the incidence of jaundice in children and this is a healthy practice[2]. 16% had practiced branding, applying leaf extracts (pasaru) in newborns. Traditional practice of treating illness by branding of skin, using leaf extracts are brutal practices, may affect the health of newborn[2]

In this study majority (84%)of the participants applied kajal on baby's face to prevent from evil eye, this finding is similar to study conducted by Reshma[3] et al and a FGD conducted by Canturk Capik[6] et al, Jamila Abuidhail[7] et al. Applying kajal to eye may result in conjunctivites[2]. Almost all participants used kajal/ amulets/ black threads/ using camphor to prevent the newborn from evil eyes.

In this study more than half (54%) of participants were accepting statements like "empty cradle should not be moved, baby should not taken out after 6 PM, baby clothes should not be dried outside" this finding is also observed (59%) in a study conducted by Reshma[3] et al. This was more in illiterates compared to literates (χ^2 =24.006, p <0.000). They believe that if baby clothes dried outside at night some insects & lizards may crawl on clothes, may affect the health of the baby. Some were in belief that if baby was taken outside after 6 PM, some birds may fly over the baby and may leads to ghost intrusions into the baby. This area needs the focus of importance of health education to all mothers & women of reproductive age group.

In this study we observed more than half (55%) of participants had a practice of blowing air into nose, ears, anterior fontanel to clear mucous, where as it is 92% in a study conducted by Leena Sankar JL[5]etal in Trivandrum. This practice needs to be changed, sometimes may cause risk to new born.

CONCLUSION:

In our study we observed majority of them started breast feeding within 4 hours. Three fourth are giving prelacteal feeds like honey, sugar water. A lot of participants were in belief that colostrums is not good for Newborn, some are practicing home remedies for digestion, using hot water to evacuate stools. Majority used antiseptic powder in cord care. Fallen umbilical cord was given to others in belief that if they swallow the cord, they will have children in future. Majority will go to doctor if the baby had jaundice. Some of them practicing branding, pasaru (leaves extract), amulets as remedies for jaundice. Most of them using kajal on face of newborn, tying amulets, black threads, using camphor to protect from evil eye. Most of them still accepting empty cradle not moved, baby not taken out, baby clothes not placed outside at nights etc**.** In conclusion, mothers adopted a few safe practices; however, there were gaps in the adoption of several safe practices despite being informed of them. There is a need for dissemination of information and education regarding optimal breastfeeding practices and for protecting and promoting healthy practices.

RECCOMENDATIONS:

Periodical health education regarding do's and don'ts of newborn care should be conducted which will definitely minimize the unhealthy traditional practices. There are many such practices, rituals, beliefs and offerings which either protect or harm the health of the baby. Maternal education plays an important role in newborn care. Educating the mother regarding importance of breast feeding, colostrums feeding is necessary. Involvement of pregnant and lactating mothers, elderly women in various IEC activities is desirable as they all have an important role in initiation of breastfeeding and other healthy feeding practices at the community level.

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Original Research Article

False beliefs about causation of Diabetes Mellitus among adults in Urban Pondicherry - A cross sectional study.

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Abstract

Introduction: Misconceptions about Diabetes is a hurdle in effective prevention and control, specifically in India. **Objectives:** 1. To assess the false beliefs about causation of Diabetes Mellitus.2. To assess the socio-demographic factors associated with false beliefs about causation of Diabetes Mellitus. **Material and Methods:** Present cross sectional study was conducted among 406 subjects at peripheral health centre of a tertiary teaching hospital in Pondicherry during June-July2011. Information related to socio-demographic profile, diabetes status and misconceptions about causation of diabetes mellitus was obtained. For data entry and analysis MS-excel and Epi-Info software were used. **Results:** Total 406 adult patients were interviewed. Total 25.9% patients attending to health centre were diabetic. Among the nine selected misconceptions, commonest was "Diabetes occurs only in old age" (59.4%) followed by the misbelief "Diabetes is mainly an inherited disease". The false belief "Diabetes occurs only in old age", was significantly more common among men (65.6%) compared to women (55.1%). Religion showed significant association with most of the misconceptions. Education was found to be significantly associated with only two of the misconceptions. There were no significant differences regarding misconceptions between Diabetics and non-diabetics. **Conclusion:** The common misconceptions among the subjects were of occurrence of diabetes only in old age, consuming more sugar directly leads to causation of diabetes and diabetes is mainly an inherited disease. The results of our study suggested that people are having less awareness about the disease.

Key words: Diabetes, Mellitus, misconception, belief, awareness, causation

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Introduction

Diabetes Mellitus is an ancient disease commonly known as "*Madhumeh*" in India. It is a highly prevalent non-communicable disease. The number of people with diabetes has increased from 108 million (yr. 1980) to 422 million (yr.2014). The global prevalence of diabetes among adults doubled from 4.7% (yr. 1980) to 8.5% (yr. 2014). Diabetes prevalence has been rising more rapidly in middle- and low-income countries[1]. There is no nationwide study in India to find the prevalence but it was reported from 6.1% to 16.6% in a study done in metropolitan cities.[2]

Diabetes is one of the diseases for which people have different beliefs about its causation as well as management. Misconceptions are false beliefs which are transferred from one generation to another due to lack of awareness. Some studies showed that, misconceptions and lack of knowledge are significant barriers to adequate management of Diabetes.[3, 4]

There is a lack of research related to false beliefs in Diabetes Mellitus. Present study is an attempt to know what misconceptions are prevalent in selected

urban population of Pondicherry and its associated socio-demographic factors.

Objectives

1. To assess the false beliefs about causation of Diabetes Mellitus.
2. To assess the socio-demographic factors associated with false beliefs about causation of Diabetes Mellitus.

Material and Methods

A cross sectional study was conducted at Urban Health and Training Centre(UHTC)of Department of Community Medicine of Mahatma Gandhi Medical College and Research Institute, Pondicherry. Ethical permission from Institutional Ethical Committee was obtained for the study.

All adult patients (diabetic and non-diabetic) visiting the UHTC were asked to participate in the study during June-July 2011, those who gave the consent for the study were interviewed. Data were collected by one of the authors. A pretested semi-structured interview schedule in local language was used to collect the data.

Information related to socio-demographic profile, diabetes status and misconceptions about causation of diabetes mellitus was obtained. Diabetic status of the patient was decided based on the self-reporting of disease by the patient.

For data entry and analysis MS-excel and Epi-Info software (7.1.5) were used. Chi-square test was used to see any significant association between different factors and the false beliefs. P value of less than 0.05 was considered statistically significant at 95% level.

Results

In present study, total 406 adult patients were interviewed. Study group comprised of 59.9% females and 40.1% males. Total 25.9% patients attending to health centre were diabetic. Majority (74.9%) of the participants were Hindu (Table1).The mean age of the participants was 44.2 years (SD 17.2).

Among the nine selected misconceptions, commonest was “Diabetes occurs only in old age” (59.4%) followed by another misbelief that “Diabetes is mainly an inherited disease”. (Table 2).

The false belief“Diabetes occurs only in old age”, was significantlymore common among men (65.6%) compared to women (55.1%). Religion showed significant association with most of the misconceptions. Muslims were having more misconceptions as compared to others and the most common belief in each religion was “Diabetes occurs only in old age” (Table 3)

Table 1: Background characteristics of the study subjects

Characteristic		No. (%)
Gender	Female	243(59.9)
	Male	163(40.1)
Religion	Hindu	304(74.9)
	Muslim	45(11.1)
	Christian	57(14)
Education	Illiterate	111(27.3)
	Primary and Middle	189(46.6)
	High school and above	106(26.1)
Diabetic status	Diabetic	105(25.9)
	Non-Diabetic	301(74.1)

Table 2: Misconceptions about causation of Diabetes Mellitus among participants

Misconception	No (%)
Diabetes occurs only in old age	241(59.4)
Diabetes predominantly affects men	112(27.6)
Diabetes is mainly a disease of rich people	128(31.5)
Diabetes is not a serious disease	130(32.0)
Diabetes can’t be prevented	152(37.4)
Diabetes is caused by past sins	144(35.5)
Diabetes is contagious	105(25.9)
Diabetes is mainly an inherited disease	200(49.3)
Consuming more sugar can directly cause Diabetes Mellitus	179(44.1)

Education was found to be significantly associated with two misconceptions: “diabetes is caused by past sins” and “diabetes is mainly a disease of rich people”. There were no significant differences regarding misconceptions between Diabetics and non-diabetics. Most of the diabetics (57.1%) as well as non-diabetics (60.1%) believed that diabetes occurs only in old age. (Table 4)

Discussion

Present study has shown that there are many misconceptions about diabetes in people. Misconceptions are barriers for prevention and treatment of a disease and these are often shaped in the minds of people by folklore and hearsay.[5]Most common misconception in present study was “Diabetes occurs only in old age”. As the age advances there is higher risk ofdeveloping diabetes but children and middle age people can also develop

Table 3: Gender and religion wise distribution of misconceptions

Misconception	Gender			Religion			
	Female (n 243)	Male (n 163)	P value	Hindu (n 304)	Muslim (n 45)	Christian (n 57)	P value
Diabetes occurs only in old age	134(55.1)	107(65.6)	0.03*	162(53.3)	36(80)	43(75.4)	0.0004*
Diabetes predominantly affects men	60(24.7)	52(31.9)	0.11	68(22.4)	21(46.7)	23(40.4)	0.0004*
Diabetes is mainly a disease of rich people	71(29.2)	57(35.0)	0.22	75(24.7)	22(48.9)	31(54.4)	0.0003*
Diabetes is not a serious disease	74(30.5)	56(34.4)	0.4	89(29.3)	22(48.9)	19(33.3)	0.008*
Diabetes can't be prevented	89(36.6)	63(38.7)	0.67	116(38.2)	23(51.1)	13(22.8)	0.05
Diabetes is caused by past sins	92(37.7)	52(31.9)	0.21	102(33.6)	19(42.2)	23(40.4)	0.23
Diabetes is contagious	63(25.9)	42(25.8)	0.97	71(23.4)	22(48.9)	12(21.1)	0.0002*
Diabetes is mainly an inherited disease	114(46.9)	87(53.4)	0.2	149(49)	19(42.2)	32(56.1)	0.34
Consuming more sugar can directly cause Diabetes Mellitus	105(43.3)	74(45.4)	0.66	137(45.1)	20(44.4)	22(38.6)	0.72

Figures in parenthesis are percentages, * significant

Table 4: Education and diabetic status wise distribution of misconceptions

Misconception	Education				Diabetic status		
	Illiterate (n111)	Primary &Middle (n189)	High school/above (n106)	P value	Diabetic (n105)	Non-diabetic (n301)	P value
Diabetes occurs only in old age	64(57.7)	114(60.3)	63(59.4)	0.65	60(57.1)	181(60.1)	0.59
Diabetes predominantly affects men	35(31.5)	48(25.4)	29(27.4)	0.25	31(29.5)	81(26.9)	0.6
Diabetes is mainly a disease of rich people	27(24.3)	70(37.0)	31(29.2)	0.02*	30(28.6)	98(32.6)	0.45
Diabetes is not a serious disease	35(31.5)	59(31.2)	36(33.9)	0.79	33(31.4)	97(32.2)	0.88
Diabetes can't be prevented	39(35.1)	83(43.9)	30(28.3)	0.05	36(34.3)	116(38.5)	0.44
Diabetes is caused by past sins	51(45.9)	62(32.8)	31(29.2)	0.01*	40(38.1)	104(34.6)	0.05
Diabetes is contagious	29(26.1)	53(28.0)	23(21.7)	0.49	31(29.5)	74(24.6)	0.32
Diabetes is mainly an inherited disease	61(55.0)	93(49.2)	46(43.4)	0.23	57(54.3)	143(47.5)	0.23
Consuming more sugar can directly cause Diabetes	54(48.6)	79(41.8)	46(43.4)	0.25	50(47.6)	129(42.9)	0.39

Figures in parenthesis are percentages, * significant

the diabetes. Another common myth was that Diabetes can't be prevented; this signifies the need for education about prevention which includes weight control, physical exercise and a balanced healthy diet. Diabetes being asymptomatic most of the time doesn't interfere with daily routine and patients ignore the condition until they develop some complication.

Nearly half of the participants in our study believed that "Diabetes is mainly an inherited disease",

Where as in a study by Rehman et al.[6] in Andhra Pradesh, this belief was seen among 38.5% subjects. Sabra et al.[7] in Saudi Arabia, reported that about two-thirds of the persons believed that DM is mainly an inherited disease. In another study by Ahmed et al.[8]this belief was seen in 70% patients. In the study by Rehman et al.[6]it was observed that 16.5% persons believed that Diabetes is a contagious disease, while in present study it was about 25%.In our study, we found that nearly half of the participants had false belief that sugar intake can directly cause diabetes, almost similar finding was also seen by Rehman et al.[6], while this belief was prevalent in 22% subjects in a study by Rai et al.[9] it was reported in 65.9%, 71.6% and 69% subjects in three studies by Sabra et al.[7], Sharaf et al. [10] and Ahmed et al.[8] respectively in Saudi Arabia. In reality, excessive sugar consumption leads to obesity and obesity is the risk factor for majority of the NCDs but it is unlikely that sugar intake will directly lead to diabetes. People may have thinking that the consumed sugar in required amount is used by the body and remaining sugar appears in the blood.

We studied the relation of gender, religion, education and diabetic status with false beliefs.

Gender was not found to be significant factor associated with most of the myths. When compared for gender, only one belief "Diabetes occurs only in old age" was significantly more in men. Nisar et al.[11] in Pakistan also documented that there was no significant difference between men and women. Contrary finding was seen by Rai et al.[9]in New Delhi.

In our study, we found that religion is an important factor. Muslims were having more myths as compared to Hindus; it indicates low level of awareness among the Muslim population. This fact should be taken into consideration when planning for Information, Education and Communication (IEC) activities related to diabetes. In a study by Rai et al.[9], diabetes myths were seen almost equally among Hindus and Muslims.

Although it is said that educational status is an important factor in determining the health awareness, in the present study the difference was seen only for two misconceptions, while Rai et al.[9]reported that education is a significant factor for most of the myths. There were no significant differences in false beliefs between Diabetics and Non Diabetics. It showed that diabetics were also not aware about their own ailment. Diabetics were not well informed and there was lack of awareness in both the groups (Diabetics and Non-Diabetics).We should utilize the opportunity of diabetic patients' visits to health centers to provide health education regarding their condition and the prevention in other people.

The health awareness level even among the diabetics in a study done by Ahmed A et al.[8] in Saudi Arabia implies the current need of community based health education activities viewing the submerged portion of ice-berg in community.

Conclusion: There were many false beliefs found among the adult population attending the urban peripheral health center. The common ones were of occurrence of diabetes in old age, consuming more sugar directly leads to causation of diabetes and diabetes is mainly an inherited disease. The results of our study suggested that people are having less knowledge and awareness about the disease and there is a need to fill the knowledge gap.

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Original Research Article

A Study of Feeding Practices in the babies of urban educated mothers attending well baby clinic of a tertiary care maternity hospital.

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Abstract

Background: Ideal food for the young infant is human milk which has the specific characteristics that matches the growing infant's nutritional requirement. It is the nature's first food for babies. It provides all the energy and nutrients that the infant needs in early months. **Methods:** Total of 100 healthy mothers and their healthy newborns in between the age of 15-30 days were taken in study group during September 2015 to July 2016 of tertiary care maternity hospital of Rajasthan. All the mothers were interviewed as per standardized proforma regarding the feeding practices of their newborn. The information thus obtained were compiled, tabulated and analyzed statistically to draw out observations. **Results:** Kuppuswamy's socioeconomic scale showed that 10% mothers belonged to class-1(upper), 25% belonged to class-2 (upper middle) and rest of 65% mothers belonged to class-3 (lower middle). In the present study it was found that 68% mothers initiated breastfeeding within one hour and 88% mothers were aware regarding usefulness of colostrum. Study revealed that 35% mothers were giving feed to their babies by fixed schedule and 65% babies received on demand. On demand feed was more common in working mothers, upper middle class and postgraduate mothers (84%). **Conclusion:** Knowledge regarding exclusive breast feeding was more in nuclear, upper middle class and higher educated working mothers but for 100% achievement of initiation of breastfeeding practices the study recommends that there is necessity to promote knowledge of the mothers about breast feeding

Key words: Breast Feeding, Colostrum, Top Feeding, Complementary feeding, Infant Feeding practices

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INTRODUCTION:

Ideal food for the young infant is human milk which has the specific characteristics that matches the growing infants' nutritional requirement. It is the nature's first food for babies. It provides all the energy and nutrients that the infant needs in early months [1]. Despite the demonstrated benefits of breast feeding, the prevalence and duration in many countries are still lower than the international recommendation of exclusive breast feeding for the first six months of life [2]. Beneficial effects of breastfeeding depend on the time of breast feeding initiation, its duration and the age at which breastfed child is weaned [3]. Breastfeeding has declined worldwide in recent years, as a result of urbanization, marketing of infant milk formula and maternal employment outside the home. Studies in India have also shown a decline in breastfeeding trends, especially in urban areas [4]. The United Nations Children's Fund (UNICEF) has estimated that exclusive breastfeeding in the first six months of life can reduce under five mortality rates in developing countries by 13%[5].

It has been observed that infants aged 0-5 months who are not breast fed have seven fold and fivefold increased risk of death from diarrhea and pneumonia. Breast feeding practices vary among the different regions and communities in India. Frequent monitoring of changing trends in these practices is therefore necessary in societies in highly dynamic states of development. Hence the objectives of present study were to assess the breast feeding practices and its socio-demographic determents in babies of urban educated mothers.

MATERIAL AND METHODS:

The present descriptive type of observational study was conducted in 100 consecutive healthy mothers and their healthy newborns between ages of 15-30 days who attended well baby clinic during study period from September 2015 to July 2015 at Mahila Chikitsalya, Jaipur (Rajasthan) after discharge from postnatal wards. A sample size of 100 was determined at 95% confidence level assuming 50% appropriate feeding practices and absolute allowable error of 10%. All consecutive mothers were enrolled. No sampling technique was required as sampling frame was notional. Babies of HIV seropositive mothers, congenital malformation, any medical or surgical condition in mothers and history of admission in NICU were excluded from study. A verbal and written consent was taken from the respondents before collecting the information. All the mothers were interviewed as per standardized proforma regarding the feeding practices of their newborns. Though proforma was made in English but questions were asked in their best understanding local language. General information regarding education, occupation, income of family and type of family were taken. Socioeconomic status was given to family according to Kuppuswamy's socioeconomic scale [6]. Mothers were divided into four groups: 1.Exclusive breast feeding, 2. Breastfeeding +Homemade remedies/multivitamin/Calcium, 3.Breastfeeding + Top feeding, 4.Only Top feeding.

Statistical analysis: All data were entered in Microsoft excel and subjected for statistical analysis. Continuous variables were summarized as mean and standard deviation whereas nominal/categorical variables as proportions / percentages. Pearson Chi Square test was used for analysis of nominal/categorical variables. P value < 0.05 was taken as significant. SPSS 20.0 version software was used for all statistical calculations.

RESULTS :

Of the total 38% were female and 62% were male child. 93% of babies were full-term and 7% babies were preterm. 72% were delivered normally and 28% by cesarean. Maximum number of newborns had birth weight < 2.5 kg. (75%). In the present study it was found that 68% mothers initiated breastfeeding within one hour. Study showed breastfeeding within one hour was initiated only in 38% of the newborns where as 41% received between 1-4 hrs and delayed by more than 4 hours in case of 21% newborns. In our study, 88% of mothers were aware of the usefulness of colostrum. Study revealed that 33% babies received top feed (only formula milk) in the hospital. Most of the babies who received top feed were cesarean deliveries (25%). Others were due to other obstetric complications. Top feed was more common in the hospital in upper class (60%). (Table-)

Study revealed that 35% mothers were giving feed to their baby by fixed schedule and 65% babies received on demand. On demand feed was more common in working mothers, upper middle class and postgraduate mothers (84%). This association was statistically significant (P <0.05). Out of Total 15 mothers using top feed, 10 (67%) were using formula milk, 5(33%) were using animal milk. Top feeding was more in cesarean delivery. Out of 15, 60% mothers fed by wati spoon and 40% fed by bottle feeding.(Table-2). Unfortunately in our study 60% mothers initiated Top feed by medical advice and 40% initiated self. Working mothers were more in favour of bottle feeding but statistical association was not significant (P>0.05). Study showed that 71% mothers were aware of latching on.

Study showed that exclusive breast feeding was practiced at the time of interview by 19% mothers and 66% were supplementing with calcium and multivitamin. 15% mothers were giving top feed and breast feeding. Exclusive breast feeding was more in

upper middle class (32%). 40% of mothers of upper class were giving top feed and breast feed. This association was significant between socioeconomic status and feeding status (P< 0.05). (Table-2).

Table 1: Feeding Practices among Study Subjects (N= 100)

FEEDING PRACTICES	NUMBER	PERCENTAGE
Present Feeding Status		
Breastfeeding Remedies/Multivitamin/Calcium	66	66.00%
Breastfeeding +Top Feeding	15	15.00%
Exclusive Breastfeeding	19	19.00%
1st Feed Offered		
<1 hr.	68	68.00%
>= 1 hr.	32	32.00%
Awareness of Colostrum		
Yes	81	81.00%
No	19	19.00%
Feeding Schedule		
Demand	65	65.00%
Fixed	35	35.00%
Top Feed Type		
Animal	5	5.00%
Formula	10	10.00%
No top feed	85	85.00%
Top Feed Method		
Bottle	6	40.00%
Wati-spoon	9	60.00%

And 84% mothers fed their babies around 9-12 times, 9% fed < 8 times and 7% fed more than 12 times. 86% of mothers were aware of burping. Higher educated mothers were more aware of burping. As the education increased, awareness of burping increased. This association was statistically significant (P <0.05). Only 59% mothers knew that breast feeding should be continued for 2 yrs and above. 65% mothers had the knowledge that initiation of complementary feeding should be at 6 months of age. In our study no mother discontinued breastfeeding in between 15 to 30 days. Only 35% babies received exclusive breast feed by 6 months of age. In our study exclusive breast feeding rate was more in nuclear family. This was statistically significant association (P<0.05).

Table 2: Association of Various Demographic Factor with Present Feeding Status (N=100)

Demographic Factor		Present Feeding Status			Total
		B/F+Remedies/MV/Ca	B/F+Top Feed	Exclusive B/F	
		No.(%)	No.(%)	No.(%)	
Socio Economic Status	Lower Middle	48 (73.9)	6 (9.2)	11 (16.9)	65 (100)
	Upper Middle	12 (48.0)	5 (20.0)	8 (32.0)	25 (100)
	Upper	6 (60.0)	4 (40.0)	0 (0.0)	10 (100)
Education Status	1 to 5thstd	5 (71.4)	1 (14.3)	1 (14.3)	7 (100)
	6 to 10thstd	18 (60.0)	6 (20.0)	6 (20.0)	30 (100)
	Graduate	40 (71.4)	6 (10.7)	10 (17.9)	56 (100)
	Post Graduate	3 (42.8)	2 (28.6)	2 (28.6)	7 (100)
Type of Family	Joint	49 (65.3)	15 (20.0)	11 (14.7)	75 (100)
	Nuclear	17 (68.0)	0 (0.0)	8 (32.0)	25 (100)

B/F – Breast feeding, MV – Multivitamin, Ca – Calcium, std - Standard

DISCUSSION:

The socioeconomic status of the 100 mothers according to Kuppuswamy's socioeconomic scale showed that 10% mothers belonged to class-1 (upper), 25% belonged to class-2 (upper middle) and rest of 65% mothers belonged to class-3 (lower middle). No mother was found in class – 4 (upper lower) and class – 5 (lower) category. Maximum number of mothers was house makers (72%) as compared to employed (28%). 75% of mothers were living in a joint family and 25% in a nuclear family. Study showed that exclusive breast feeding was practiced at the time of interview by 19% and 66% of mothers were supplementing with calcium and multivitamin. 15% mothers were giving top feed and breast feeding. Exclusive breast feeding was more in upper middle class (32%). 40% of mothers of upper class were giving top feed and breast feed. This association was significant between socioeconomic

status and feeding status (P <0.05). Most of general characteristics of the study subjects and newborns were comparable to study done by Sanjay V Wagh et al [7].

In the present study it was found that 68% the mothers initiated breastfeeding within one hour. This figure was comparable with the study done in Uttarakhand conducted in department of women empowerment and child development by Breastfeeding Promotion Network of India (BPNI) which showed breastfeeding within one hour was initiated only in 38% of the newborns where as 41% received between 1-4 hrs., and delayed by more than 4 hours in case of 21% newborns [8]. Study done by Mridula Bandyopadhyay showed that only 16.5% initiated breastfeeding within one hour of giving birth. About half did not start breastfeeding until at least 24 hrs. After birth [9].

Existing status according the National Family health Survey-3 (NFHS) document revealed that percentage of babies breastfeeding within one hour of birth was 15.8% [10]. Similar results were reported by Vyas Shaili et al [8], Kar et al[11] and Takalkar et al [12]. The high figure in our study was due to cumulative efforts of nursing staff, neonatologists and concerning obstetrician. Remaining 28% were late due to LSCS delivery and other obstetric complications. In contrast to our findings breast feeding within one hour and 24 hour was lower in study by Kumar D et al [13] and Chatterjee et al [14] where breast feeding within one hour was only 6.3% and 14.54% and 32.6% within 24 hours. These differences may be due to the timings when study was conducted, regional differences and sampling techniques.

Higher rate of initiation of breast feeding within one hour was presented by K. Madhu et al (92%) [15] and Sanjay V Wagh et al (80.48%) [7]. this difference may be due to local culture beliefs and practices that existed in particular regions. In our study, 88% of mothers were aware of the usefulness of colostrum. Study done in P.G.I. Chandigarh by Kishore MSS et al revealed that 39% of mothers had satisfactory breast feeding knowledge [16]. Study done by Bandyopadhyay in West Bengal showed that major reason of delayed breast feeding (49%) was due to belief that colostrum was harmful to the baby [17]. The high percentage in our study may be due to educated mothers and regular antenatal checkups.

Our study revealed that 35% mothers were giving feed to their babies by fixed schedule and 65% babies received on demand. On demand feed was more common in working mothers, upper middle class and postgraduate mothers (84%). This association was statistically significant (P <0.05). Retrospective study done in West Bengal by Mridula Bandyopadhyay showed that (84.1%) babies received breast feed on demand [9]. A descriptive cross sectional study done by K. Madhu showed that total of 84% mothers followed on demand feeding practices [15].

Out of total 15 mothers using top feed, 10 (67%) were using formula milk, 5(33%) were using animal milk. Top feeding was more in cesarean delivery and often delayed early initiation of breast feeding, infant mother bonding and development of prolactin reflex. Out of 15, 60% mothers fed by wati spoon and 40% fed by bottle. Unfortunately in our study 60% mothers initiated top feed by medical advice and 40% initiated self. Working mothers were more in favour of bottle feeding but statistically association was not significant (P >0.05). Existing bottle feeding rate by NFHS – 1, 2 and 3 were 14%, 15.8% and 14.8%. Our study showed that 71% mothers were aware of latching on. Study done by KishoreMSS et al showed that good attachment was 42% [16]. The high figure in our study may be due to knowledge given by pediatrician and nursing staff. Appropriate latching on will lead to appropriate frequency of breast feeding. 86% of mothers were aware of burping. Higher educated mothers were more aware of burping. As the education increased, awareness of burping was increased. This association was statistically significant (P <0.05).

Only 59% mothers knew that breast feeding should be continued for 2 yrs and above. NFHS 1, 2 and 3 data showed existing breast feeding continuation rate for 2 yrs were 73.1% in 1992, 75.3% in 1998 and 73.1% in 2005. This low figure in comparison to NFHS survey may be due to urban area, high education status and working mothers. Study in Uttrakhand by BPNI showed 67% of mothers responded it to be 18-24 months, 19% by 2 yrs. and 14% mothers said it was less than 18 months. In our

study breast feeding continuation rate was more in joint family (65.3%) in comparison to nuclear family (60%) but difference was not statistically significant (P >0.05). 65% mothers had the knowledge that initiation of complementary feeding should be at 6 months of age. Existing status according to NFHS were only 35% in 1998 and 56.7% in 2005. Study done by Mridula Bandyopadhyay showed that majority of babies received supplementary food within 6 months of age [9]. In our study working and higher educated mothers were more aware of initiation of complementary feeding at 6 months.

In our study no mother discontinued breastfeeding in between 15 to 30 days. Only 35% babies received exclusive breast feed by 6 months of age. Study doneby Kumar D et al in PGI Chandigarh showed that 30% and 10% exclusive breast feed rate was there for 4 and 6 months of age[13]. In our study exclusive breast feed rate was more in nuclear family. This was statistically significant association (P <0.05). A prospective study done by Dr. Rajesh Chudasama, breast feeding prevalence and its determinants in first 6 months of life reported the exclusive breast feeding at 3 months was 97% which declined to 62% by 6 months of age. There was no significant association between socioeconomic, demographic, maternal and infant characterstics[18].

CONCLUSION: In our study it was found that exclusive breast feeding was more in nuclear, upper middle class and higher educated working mothers. Awareness of continuation of breast feeding was more in joint family. Awareness of feeding on demand was more in working educated mothers. Overall knowledge of breast feeding was good but for 100% achievement of initiation of breastfeeding practices the study recommends that promotion of mothers knowledge about breast feeding is needed.

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Original Research Article

Unintentional/Intentional Injuries Among the Registered Cases at the Medical Record Department (MRD) at the Teaching Hospital of North India

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Abstract

Background: Indirect estimates by the World Health Organization (WHO) and the Global Burden of Diseases Study (GBD) suggest that unintentional injuries account for 3.9 million deaths worldwide [1], of which about 90% occur in low- and middle-income countries. The majority of these deaths are attributable to road traffic injuries, falls, drowning, poisoning and burns [1] **Objective:** To assess the profile of unintentional/intentional injuries from the tertiary centre along with identifying some underlying causes of their occurrence. **Methods:** Retrospective hospital based cross-sectional study is carried out of 2 years in which the medico-legal case sheets were looked in for the necessary details from the medical record department (MRD) of the tertiary care centre. **Results:** Poisoning exceeded amongst the various medicolegal cases i.e. 46.7% in 2012 and 57.3% in 2013. Males are predominantly involved. In certain cited causes, the cases might be attributed to familial stress, accidental inhalation of insecticides and others. **Conclusion:** Poisoning was the commonest form of unintentional/intentional injury reported with organophosphorus pesticides commonly taken. Familial stress, accidental inhalation were some of the contributing factors revealed in some of the cases.

Key words: Burden of Diseases, unintentional injury, Poisoning, Medico-legal cases

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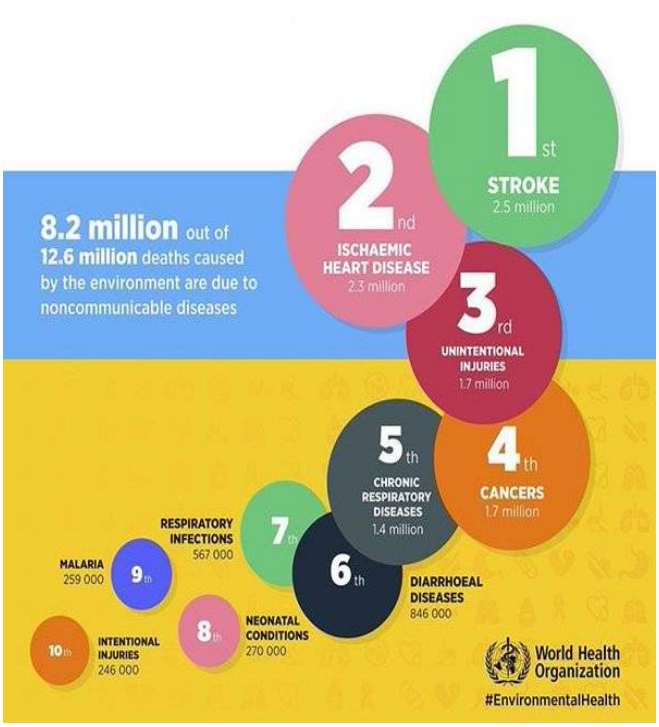
Introduction:

Medico-legal cases (MLC) constitute a considerable segment of emergencies brought to emergency medicine department of a tertiary care hospital. Therefore, apart from medical emergencies the doctor needs to be sensitive about MLC which constitute a substantial proportion and their exhaustive documentation is mandatory. [2] A MLC is a case of injury or illness where the attending doctor, after eliciting history & examining the patient, thinks that some investigation by law enforcement agencies is essential to establish & fix responsibility for the case in accordance with the law of the land. [3]

Profiling of medicolegal cases is an integral aspect for the prevention of preventable casualties in future and to study the crime rate in area. [4] Five of the 15 leading causes of death in persons 15–29 years of age are unintentional injury related, including road traffic injuries, drowning, burns, poisoning, and falls .[5] Also, as shown in the picture below, WHO has listed unintentional injuries as the 3rd cause of death due to environment.

Fig.1. Top 10 causes of death from the environment(WHO)



Thus, an attempt is made in this study so that the data findings can supplement the national data of reporting of medico-legal cases which helps in attaining the effective intersectoral counter measures, evaluation and strategies for their prevention . Also, it is desired in this research project to draw attention of policy makers towards low priority issues of intentional/unintentional injuries as deaths, disabilities and impact of socio-economic loss to individuals, families, society & infrastructure. Although in the present study only picture of death due to MLC cases has been shown.

So we study the profile of medico-legal cases reported at the tertiary centre in the 2 years and study selected antecedent underlying factors for their occurrence.

Material and methods:

A hospital based Retrospective Cross-sectional Study among MLC cases reported at the tertiary centre in the 2 years in MRD of GMC Haldwani-Uttarakhand

Sample size : Complete enumeration. There were 7 systemic disease case file in 2013 and 5 in 2012 with 2 incomplete MLC case sheet file in 2012 and 1 in 2013. Hence, they were excluded and n=306 in 2012 & n=347 in 2013 were taken for study.

Methodology: The investigator looked in the MLC files deposited in the MRD section from various departments of the hospital in the years 2012 & 2013 for the data collection. The variables in semi-structured questionnaire for which the information was collected includes age, sex, type of MLC case, district, refer from, date of admission & discharge, time of incident if available, factors responsible for the occurrence of MLC case if noted in the file, treatment given and outcome of these cases. The master chart was made in microsoft excel 2007.

Operational definitions used in the study:

Hanging: It is a form of asphyxia which is caused by suspension of the body by ligature which encircles the neck, the constricting force being the weight of the body. [6]

Strangulation/Throttling: Application of external pressure on the neck either by bare hands, or by ligature, or by any other material. It is a form of asphyxia caused by constriction of the neck without suspending the body. Strangulation that is effected by a ligature is called ligature strangulation while that which is accomplished by bare hands is called manual strangulation or throttling. [6]

Drowning: It is a form of asphyxia due to aspiration of fluid into air passages caused by submersion in water or other fluid. Complete submersion is not necessary for submersion of the nose and mouth alone for a sufficient period can cause death from drowning.[6]

Poisoning: It occurs when any substance interferes with normal body functions after it is swallowed, inhaled, injected or absorbed.[6]

Burns: A burn is an injury to the skin or other organic tissue primarily caused by heat or due to radiations, radioactivity, electricity, friction or contact with chemicals (WHO fact sheet on burns)

Stab injury: This type of injury is produced from the penetration of pointed/sharp instruments/weapons on to the depth of the body i.e is deeper than its length, generally knives, broken glass bottles and tools etc. [7]

Assault: It is an unlawful act that places another person without that person consent in fear of immediate bodily harm. [6]

Fire-arm injury: A bullet passing through a body produces a wound at the point of entrance on the skin known as entry wound & another at the point of exit of the bullet known as exit wound. The injuries produced by FA vary, depending on the projectile, the muzzle velocity, distance, angle of firing & part of the body involved. [7]

Suicide: It is death caused by self directed injurious behaviour with any intent to die as a result of the behaviour. (CDC 2011)

The miscellaneous group comprises of fall from height (FFH), fall from stairs, beaten case, animal bite,

trauma/injury like body part caught in machine and sexual assault case.

Ethical approval was taken for the study from the college ethical committee and permission letter obtained from the medical superintendent of the hospital before carrying out the study.

Statistical analysis: The collected secondary data is collated, checked for errors and entered into ms excel 2007. The analysis was done using percentages in SPSS-18 (IBM-SPSS).

Results:

Amongst the medico-legal cases recorded in the year 2012 & 2013, the poisoning, burn and assault/stab injury & miscellaneous were found in greater percentages which is 46.7%, 19%, 13.4% & 10.1% in 2012 and 57.3%, 13.5%, 8.9% & 13.3% in 2013 respectively. The gun shot injury cases was 4.6% in 2012 and 0.9% in 2013. However, train accident and prisoner cases was 0.7% & 1.6% respectively in 2012 and 1.7% & 2.6% in 2013. No alcoholic intoxication was found in 2013 which is 0.7% in 2012.

Table 1: Profile of other medico-legal cases in the year 2012 & 2013

Medico-legal cases	2012	2013
	Number (%)	Number (%)
Burn	58 (19)	47(13.5)
Poisoning	143(46.7)	199 (57.3)
Assault/stab injury	41 (13.4)	31 (8.9)
Hanging/strangulation/drowning/throttling/cut throat	8 (2.6)	4 (1.2)
Firearm/gun shot injury	14 (4.6)	3 (0.9)
Miscellaneous	31 (10.1)	46 (13.3)
Prisoner	5 (1.6)	9 (2.6)
Train injury/accident	2 (0.7)	6 (1.7)
Alcoholic intoxications	2 (0.7)	0 (0)
Unclassified	2 (0.7)	2 (0.6)
Total	306 (100)	347 (100)

Table 2a): Socio-demographic profile of burn, poisoning & assault cases in the 2 years

Characteristics	Burn		Poisoning		Assault	
	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n=41)	2013 (n=31)
Mean age (years)	28.71 ± 14.36	27.97 ± 15.6	26.06 ± 9.29	27.84 ± 13.7	38.56 ± 18.89	35.35 ± 15.79
Median age	26 years	24 years	24 years	24 years	35 years	32 years
Age range	1.5 to 69 years	3 to 70 years	3 to 60 years	1 to 80 years	16 to 84 years	16 to 88 years
Male:Female	27:31	26:21	86:57	102:97*	33:8	20:11
Single:married:widower	19:39:0	15:32	57:85:1	107:92	12:29	9:22
Religion	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n-41)	2013 (n=31)
Hindu	51 (87.9%)	41 (87.2%)	122 (85.3%)	168 (84.4%)	35 (85.4%)	23 (74.2%)
Muslim	7 (12.1)	6 (12.8%)	19 (13.3%)	28 (14.1%)	5 (12.2%)	7 (22.6%)
Others	0%	0%	2 (1.4%)	3 (1.5%)	1 (2.4%)	1 (3.2%)
States	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n=41)	2013 (n=31)
Uttarakhand	53 (91.4%)	40 (85.1%)	138 (96.5%)	193 (97%)	40 (97.6%)	31 (100%)
UP	5 (8.6%)	7 (14.9%)	5 (3.5%)	6 (3%)	1 (2.4%)	0%

*In 2013 the 7 cases of poisoning were reported in pregnant women.

The median age of poisoning cases in 2012 & 2013 and burn in 2013 was 24 years and those of burn cases in 2012 was 26 years with higher median age of 32 & 35 years respectively in 2012 & 2013 of assault cases. The male sex is invariably involved more than female sex as shown by the sex ratio. Predominantly belonged to Hindu religion and were residing in Uttarakhand state.

Table 2b): Descriptive Profile of Burn, Poisoning and Assault Cases in the 2 Years

Referred from	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n=41)	2013 (n=31)
District hospital	29 (50%)	15 (31.9%)	57 (39.9%)	59 (29.6%)	14 (34.1%)	9 (29%)
CHC	6 (10.3%)	10 (21.3%)	14 (9.8%)	36 (18.1%)	7 (17.1%)	11 (35.5%)
PHC	3 (5.2%)	0 (0%)	2 (1.4%)	4 (2%)	2 (4.9%)	0 (0%)
Private hospital	0 (0%)	3 (6.4%)	8 (5.6%)	9 (4.5%)	1 (2.4%)	0 (0%)
Not referred	20 (34.5%)	19 (40.4%)	62 (43.4%)	91 (45.7%)	17 (41.5%)	11 (35.5%)
Time taken to reach tertiary centre	2012 (n=45)	2013 (n=34)	2012 (n=112)	2013 (n=151)	2012 (n=29)	2013 (n=23)
≤1 hr	3 (6.7%)	0 (0%)	21 (18.8%)	29 (19.2%)	1 (3.4%)	0 (0%)
>1-6 hr	9 (20%)	16 (47.1%)	64 (57.1%)	81 (53.6%)	9 (31%)	9 (39.1%)
>6 hr	33 (73.3%)	18 (52.9%)	27 (24.1%)	41 (27.2%)	19 (65.5%)	14 (60.9%)
Duration of hospital stay (days)	2012 (n=56)	2013 (n=43)	2012 (n=124)	2013 (n=171)	2012 (n=39)	2013 (n=30)
Median duration	5 days	7 days	2 days	2 days	7 days	6 days
Range of duration stay	1 to 37 days	1 to 47 days	1 to 11 days	1 to 14 days	1 to 57 days	1 to 18 days
Treatment taken	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n=41)	2013 (n=31)
Conservative	57 (98.3%)	47	143	199	27 (65.9%)	21 (67.7%)
Operation	1 (1.7%)	0%	0%	0%	14 (34.1%)	10 (32.3%)
Outcome of cases	2012 (n=58)	2013 (n=47)	2012 (n=143)	2013 (n=199)	2012 (n=41)	2013 (n=31)
Discharged	23 (39.7%)	26 (55.3%)	106 (74.1%)	123 (61.8%)	34 (82.9%)	29 (93.5%)
Lama	7 (12.1%)	15 (31.9%)	12 (8.4%)	60 (30.2%)	4 (9.8%)	2 (6.5%)
Expired	22 (37.9%)	3 (6.4%)	20 (14%)	15 (7.5%)	1 (2.4%)	0 (0%)
Referred	6 (10.3%)	3 (6.4%)	5 (3.5%)	1 (0.5%)	2 (4.9%)	0 (0%)

The higher percentage of referral of the MLC cases to the tertiary centre was from district hospital which is 50% & 31.9% in 2012 & 2013 (burn cases), 39.9% & 29.6% in 2012 & 2013 (poisoning) and 34.1% & 29% in 2012 & 2013 (assault). Due to record based hospital data, the number varies amongst the cases for knowing the time taken to reach tertiary centre. Most of the burn (73.3% in 2012 & 52.9% in 2013) and assault (65.5% in 2012 & 60.9% in 2013) had reached the tertiary centre in > 6hours unlike poisoning cases (57.1% & 53.6% in 2012 & 2013 respectively) were reaching in 1 to 6 hours. Excluding the number of cases who got discharged on the same day of admission and these numbers are n=2 in 2012 & n=4 in 2013 (burn), n=19 in 2012 & n=28 in 2013 (poisoning) and n=2 in 2012 & n=1 in 2013 (assault), the median duration of hospital stay of these cases varied from 2 to 7 days. The conservative management was mostly given to them except the assault cases and one burn

patient in 2012. The case fatality rate of burn cases in 2012 & 2013 was 37.9% & 6.4% respectively, 14% & 7.5% in 2012 & 2013 of poisoning cases and 2.4% of assault cases in 2012.

Table 3:Selected Antecedent Factors and some characteristics of Burn and Assault Cases in the 2 Years

Type of Burn	**2012 (n=58)**	**2013 (n=47)**
Thermal	54 (93.1%)	38 (80.9%)
Electrical	2 (3.4%)	8 (17%)
Unspecified	2 (3.4%)	1 (2.1%)
% of Burn	**2012 (n=58)**	**2013 (n=47)**
≤50%	17 (29.3%)	32 (68.1%)
>50%	36 (62.1%)	13 (27.7%)
Not specified	5 (8.6%)	2 (4.3%)
Site of Burn#	**2012 (n=58)**	**2013 (n=47)**
Upper limbs	26 (44.8%)	10 (21.3%)
Lower limbs	18 (31%)	9 (19.1%)
Chest	16 (27.6%)	12 (25.5%)
Face/neck	13 (22.4%)	8 (17%)
Back	11 (19%)	2 (4.3%)
Head/scalp	3 (5.2%)	0 (0%)
Abdomen	7 (12.1%)	7 (14.9%)
Cause of Thermal Burn	**2012 (n=54)**	**2013 (n=38)**
Flame burn	24 (44.4%)	21 (55.3%)
Cylinder burst/leaking gas stove	4 (7.4%)	9 (23.7%)
Miscellaneous*	15 (27.8%)	8 (21.1%)
Not specified	11 (20.4%)	0 (0%)
Type of assault	**2012 (n=41)**	**2013 (n=31)**
Physical	15 (36.6%)	12 (38.7%)
Stab injury	6 (14.6%)	10 (32.3%)
Unspecified	20 (48.8%)	8 (25.8%)
Sexual assault?gang rape	0%	1 (3.2%)
Cause of physical assault	**2012 (n=15)**	**2013 (n=12)**
Hit on abdomen	2 (13.3%)	2 (16.7%)
Beaten by iron rod/lathi/sticks	8 (53.3%)	6 (50%)
Fight in group	2 (13.3%)	2 (16.7%)
By jangli hathi	1 (6.6%)	0 (0%)
Unspecified	2 (13.3%)	2 (16.7%)
Cause of stab injury	**2012 (n=6)**	**2013 (n=10)**
By sword/ knife	6 (100%)	0%
By knife/hammer/darati	0%	10 (100%)

#Multiple responses

*The miscellaneous group in 2012 comprises of burn due to stove burst (n=3), scald burn (n=3), syrup spill (n=1), accidental burn due to burning of bed by mortein coil (n=1), to propel mosquito from cowshed (n=1), to protect wife (n=2), burning wood (n=2), self pouring kerosene oil (n=1). Whereas the miscellaneous group in 2013 includes scald burn (n=6) and due to wife protection (n=2).

Thermal burn was seen in maximum 93.1% with n=24 of flame burn and in 62.1% cases in 2012 and only in 27.7% cases in 2013, more than 50% of body area is burnt. The upper limbs were commonly affected in 44.8% in 2012 & 21.3% in 2013. Regarding the descriptive profile of assault, the physical assault was found in 36.6% in 2012 and 38.7% in 2013 with varied reasons of hit on abdomen, fight in group, beaten by iron rod etc. There was one sexual assault case reported in 2012.

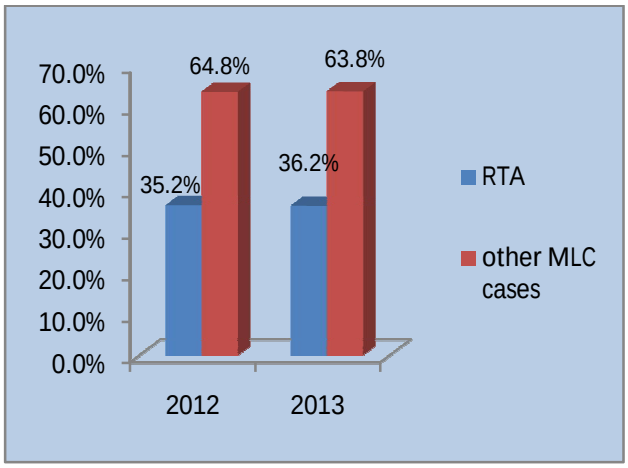
Table 4: Type of poison intake with underlying causes in some of the MLC cases in the 2 years

Year	**Type of Poison**	**Subtypes**	**Number**
2012	Insecticides	Organophosphorus	80 (n=28 celphos)
		Anti cockroach	3
		Lice killer	1
		All out	2
		Unspecified substance	13
	Tablets	Sedative	18
		Others	2 (1 is renal stone ayurvedic tab) other is antidepressant
	Others		13
	Rodenticides		8
	Not specified any substance		3

		Querrel with family	n=4
		Aggressive behaviour	n=2
		Scolded by mother d/t poor studies	n=1
	Causes of poison intake	Beaten by mother for girl with 15 wk pregnancy	n=1
		Unknown domestic stress	n=3
		Stress as husband expired*6months	n=1
		Stress due to marriage against family will	n=1
		Stress for no child*4 years	n=1
		Stress for poor performance in studies	n=1
		Job related	**Number**
		Due to job problem	n=2
		Others	**Number**
		By mistake	n=1
		Argument with teacher	n=1
		Food intake	n=1
2013	**Type of poison**	**Subtypes**	**Number**
	Insecticides	Organophosphorus	n=94 (n=37 celphos)
		All out	n=7
		Anti cockroach	n=1
		Unspecified	n=32
	Tablets	Sedatives	n=5
		Others	n=6
		Unknown tab	n=3
	Others		n=17
	Rodent		n=14
	Not specified substance		n=20
	Cause of poisoning	**Familial**	**Number**
		Querrel with family	n=7
		Stress due to husband left home	n=1
		Negative comments by mother	n-1
		Others	**Number**
		During spraying in field	n=2
		Stress due to son accident in road traffic accident	n=1

The type of substance consumed by the cases in 2012 was insecticides (69.2%), tablets (14%), rodenticides (5.6%). The other category category in 2012 includes harpic (n=2), mushroom (n=2), corrosive/phenyl (n=2), acid (n=1), nail paint remover (n=1), bioenzyme (n=1), aconite (n=1), peanut/food poisoning (n=1), petrol smell (n=1), unknown (n=1). The causes like familial, job related in the form of quarrel, stress were attributed for the poison intake. In 2013, the insecticides was found in 67.3% cases, tablets & rodenticides each with 7%. The other category in 2013 comprises of food poisoning (n=3), corrosive/phenyl (n=6), plant seeds (n=2), whitener (n=1), perfume (n=1), tv cleaner (n=1), kerosene oil (n=1), harpic (n=1), chemical poisoning (n=1). In 2013, besides the familial cause, there were n=2 cases in whom the poisoning was attributed due to accidental inhalation of insecticides during spraying in field.

Fig. 2: Distribution of total MLC cases in the 2 years



The proportion of other MLC cases being greater with 64.8% (n=306) in 2012 and 63.8% (n=347) in 2013 than that of road traffic injuries with 35.2% (n=166) in 2012 & 36.2% (n=197) in 2013 in the 2 consecutive years respectively.

Discussion

India is on the threshold of becoming a developed nation. Being a tropical country, it faces a mammoth burden of communicable diseases. Over the years, success has been achieved in controlling communicable diseases but non-communicable diseases contribute to pose a significant health problem. Infact, non-communicable diseases and injuries account for 52% of deaths in India. [8] Injuries are increasingly recognised as a global public health epidemic. Injuries represent 12% of the global disease burden and third most important cause of overall mortality. [9] Unintentional injuries contributed to 4.9% of deaths.[8]

In Kashmir study [10], out of 1136 case studied from 1st Jan 2014 to 30 June 2014 i.e 6 months, 841 (74.03%) were males & 295 (25.97%) were females. Majority of patients were between 21-30 years of age (28.3%) followed by 11-20 years & 31-40 years age groups. RTA constituted the majority of cases (48.08%) followed by assault (30.63%), poisoning (9.24%), buns (3.08%), fall from height, FFH (2.82%), machine injury (1.06%), strangulation/hanging (0.18%), drowning (0.18%), firearm injury/stone pelting (4.75%). In the present study also, there is male preponderance of 62.1% in 2012 and 59.1% in 2013 and most the young productive age group is effected with MLC cases i.e 50% in <25 years in the 2 years and 36.9% in 2013 & 39.9% in 2012 in the 25-49 years age group. In the current study, the RTAs had constituted only 36% cases unlike 48.08% in Kashmir study.

Injuries due to road-traffic, occupational accidents, burns, poisoning, suicides & violence are observed to be major causes of mortality and morbidity in the SEAR countries. [11] This is in contrast to the findings of the present study where the poisoning cases with 46.7% in 2012 & 57.3% in 2013 exceeded the RTA cases of nearly 36% in the 2 calender years and burn cases of 19% in 2012 & 13.5% in 2013. Also, the poisoning cases with 46.7% in the study constituted the majority of medico-legal cases. This finding is different to the study done by Hussaini et al in Akola, Maharashtra who reported that burns (21.87%) constituted maximum MLC cases followed by assault (19.72%), poisoning (18.70%) & RTA (16.99%), alcohol intoxications (8.62%). [12] But poisoning cases were reported highest in 84/202 cases in a study done by Yogendra Malik et al in Haryana [13]

The major causes of childhood injuries in SEARO was road-traffic, drowning, burns & fall.[14] Childhood poisoning constituted 2.1% of the total paediatric admissions. [15] In the study, it was found that poisoning cases in the age group upto 18 years was 19.5% (28/143) in 2012 and 20.1% (40/199) in 2013.

Train injury/accident cases were 0.7% in 2012 & 1.7% in 2013. They did not occur due to increase in number of trains & passengers i.e no railway fault but human own factor is involved here. The most common underlying substance in poisoning cases was pesticides being 55.9% in 2012 and 47.2% in 2013. Our country, India being predominantly agricultural dependant the pesticides are widely used & easily available for intentional & unintentional intake. The miscellaneous group comprises of falls, trauma/injury cases due to machine etc. encountered in 23.4% cases in the 2 years. Falls from rooftops, balconies, windows and staircases is responsible for the largest number of non-fatal injuries. Machine injuries occur due to unsafe man-machine interaction. In the present study, the suicidal rate was 5.22% (16/306) in 2012 and 3.45% (12/347) in 2013. It has been seen that nearly 70% of suicides in all countries has been reported in the age-group of 15-34 years with M:F ratio of 1:1.2 to 1:1.3 from different countries. Poisoning, hanging, self-immolation and drowning are the most commonly reported methods of suicide. [16]

Gender Roles influence burn injuries through risk exposure. This is evident in the proportion of work related industrial accidents, which affect more men versus the proportion of home accidents, which affect women & children more. While cooking, women in lower middle income countries may be involved in multiple tasks while preparing meals,

including caring for younger children and lapse in supervision is associated with an increased burn injury risk [17,18,19,&20] The practice of wearing loose fitting clothing such as saris while cooking has also been associated with increased burn injury risk [21,22] This finding is invariant to the present study where in 2013 the lesser (44.6%) of females affected with burn injury but in 2012 the higher (53.4%) of females were affected. Males involved more may be due to work related and protection of wife and also the underlying cause is hidden in most cases being retrospective data. Poisoning from intentional substance abuse as well as from unintentional toxic exposures remains a significant health concern for hospital emergency departments. The organophosphorus poisoning was reported in 31% , sedative drug overdosage in 5.8%, rodenticides in 4.3%, mortein in 4.9% in a study by anita paritekar & anushka waskar [23]whereas in our study the percentage of organophosphorus poisoning was 55.9% (80/143) in 2012 and 47.2% (94/199) in 2013, that of sedatives was 12.5% (18/143) in 2012 and 2.51% (5/199) in 2013 and that of rodenticides was 5.6% (8/143) in 2012 and 7.03% (14/199) in 2013. The study [13] observed that single department opinion was most common (147/202). Maximum opinion were sought from medicine(85/202), surgery (82/202) and ortho department (63/202) which is consistent with workload of these departments in other study. [24] Whereas in the present study the single department reference opinion was sought in 68.8% in 2012 and 81.6% in 2013. Maximum opinion was sought from medicine (36.4%) and psychiatry (31.2%) in 2012 while in 2013 maximum opinion was sought from psychiatry department(49.4%).

Conclusion & Recommendation: The relative percentage of poisoning cases was highest with 46.7% in 2012 & 57.3% in 2013 having insecticides reported maximum in 69.2% in 2012 and 67.3% in 2013. Half of the various MLC cases in the 2 calender years was found in younger age group i.e < 25 years with male sex predominantly involved in 62.1% & 59.1% in 2012 & 2013 respectively. The alcohol presence was reported in only one-tenth of MLC cases in the 2 years. The case fatality rate of MLC cases was 17% in 2012 and only 6.6% in 2013.Hence the frequency & pattern of MLC cases will provide vital data to administrators, health officials, social workers, NGOs to devise strategies in order to reduce these incidences.

Limitation: Barring the percentage of suicidal attempt, the study could not illustrate the manner of attempt as accidental or homicidal in these MLC cases. Being hospital based retrospective data collection, the underlying factors in these unintentional/intentional cases could not be made out.

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Original Research Article

Nutritional status of school age children (6-15 years) using the new WHO growth reference in a rural area of Bangalore, South India

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Abstract

Background: WHO AnthroPlus is a software which helps us to assess the nutritional status of school-age children and adolescents based on the new WHO Growth Reference 2007. Global Positioning System (GPS) with google earth is an innovative approach to map the spatial distribution of morbidities at the field level. The present study was undertaken to assess the nutritional status of school age children (6-15 years) using the WHO Anthroplus software, to map the spatial distribution of malnourished children using GPS and to list out the comorbid conditions associated with malnutrition. **Methods:** This was a cross sectional study conducted in the rural field practice area of a medical college, Bangalore. School children in the age group of 6-15years were the study subjects. Sample size was 2730. The schools were selected by simple random sampling and children in these schools were selected. The sample size was equally divided between the age groups 1 to 10 years. The nutritional status was assessed using the new WHO anthroplus software. The GPS coordinates of the schools and a sub sample of malnourished children were recorded and the spatial map generated using the Google Earth software. **Results:** The prevalence of thinness, stunting, underweight and overweight/obesity were 30%, 19.3%, 35.9% and 5.7%. The spatial map generated using GPS showed distribution of malnourished children in the study area. Most common comorbidities among malnourished children were dental caries/oral conditions (28.2%), URTI (13.4%), skin diseases (6.3%) and anemia (5.3%). **Conclusions:** The WHO anthroplus software was helpful in assessing the nutritional status of children accurately. The prevalence of underweight, stunting and thinness were higher compared to overweight/obesity. The spatial map constructed using GPS and google earth showed the distribution of malnourished children accurately.

Key words: Anthroplus, GPS, nutritional status, school children, WHO growth charts (5 – 19 yrs).

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Introduction

School age is a dynamic period of physical growth as well as of mental development of the child. Health problems due to miserable nutritional status in school-age children are among the most common causes of low school enrolment, high absenteeism, early dropout and unsatisfactory classroom performance. The present scenario of health and nutritional status of the school-age children in India is very unsatisfactory. The national family health survey (NFHS III) data show that 53% of children in rural areas are underweight, and this varies across states.[1] Chronic undernutrition in childhood is linked to slower cognitive development and serious health impairments later in life that reduce the quality of life of individuals. Nutritional status is an important index of this quality. In this respect, understanding the nutritional status of children has far-reaching implications for the better development of future generations.[2]

The reference previously recommended by WHO for children above 5 years of age, i.e. the National Center for Health Statistics (NCHS)/WHO international growth reference, had several drawbacks. In particular, the body mass index-for-age reference, developed in 1991, only started at 9 years of age, grouped data annually and covered a limited percentile range. Many countries pointed to the need to have body mass index (BMI) curves that start at 5 years and permit unrestricted calculation of percentile and *z*-score curves on a continuous age scale from 5 to 19 years. Hence the data from the 1977 National Center for Health Statistics (NCHS)/WHO growth reference (1–24 years) were merged with data from the new under-fives growth standards 2006'(new growth reference for 0-5 years children obtained from a Multicentre Growth Reference Study conducted in 6 countries) cross-sectional sample (18–71 months) to smooth the transition between the two samples and thus the new WHO growth references (2007) for 5-19 years were developed. The new curves were closely aligned with the WHO Child Growth Standards at 5 years, and the recommended adult cut-offs for overweight and obesity at 19 years. They fill the gap in growth curves and provide an appropriate reference for the 5 to 19 years age group.[3] WHO AnthroPlus is a new software which is freely downloadable and helps us to assess the nutritional status of school-age children and adolescents based on the WHO Reference 2007 for 5-19 years and has been used in this study.[4] There are no published studies available in India using the using the WHO anthroplus software to assess the nutritional status of school age children.

The advent of new technology has revolutionized ways in which information on health problems are disseminated. Global positioning system (GPS) is one such tool that can be used to accurately map the distribution of morbidity and mortality in the field which in turn will help in better planning of interventions in the community. It is a satellite based navigation system which sends and receives signals to and from the satellites placed around the earth. Global positioning system technology has the potential to improve our understanding of distribution of morbidity and mortality by providing information on location (latitude, longitude, and altitude); however, because the technology is relatively new, only a handful of such research studies currently exist.[5,6]

Hence in this context the present study was undertaken to assess the nutritional status of school age children (6-15 years) using the WHO Anthroplus software, to map the spatial distribution of malnourished school children using Global Positioning System and to list out the comorbid conditions associated with malnutrition.

Materials and Methods

This was an exploratory study conducted in the field practice area of the Rural Health Training Centre of a medical college in Bengaluru from January 2014 to November 2014. Approval from the Institutional Ethics Committee was obtained. School (government, aided and private) children in the age group of 6-15 years were the study subjects. A sample size of 2730 was arrived at taking the prevalence of underweight children in rural areas as 53%[1], relative precision as 5% and design effect of 2.

All schools in the study area were line listed. Schools were selected by simple random sampling. In each school, all the children in the age group of 6-15years were selected. The total sample was divided between age groups 6-15years such that each age group had equal representation of students (2730 being the total sample size, 273 children were from the age group of 6yrs, 273 from 7yrs, 273 from 8yrs and so on till 15yrs). In this manner schools were selected till the required samplesize was reached. Children absent on the day of examination were excluded.

Informed consent from the heads of the schools was obtained before examining the children. Height and weight of the subjects were recorded in the metric system using standardized techniques recommended by WHO. [7] A stadiometer capable of measuring to the accuracy of 1mm was used to measure the height. The subjects were made to stand without footwear and heals, buttocks, shoulders and occiput touching the measuring rod, hands hanging by the side. The head was held comfortably upright with the top of the head making firm contact with the horizontal head piece. Height was rounded off to the last completed millimetre.Omron digital weighing scale capable of measuring the weight with accuracy of 100g was used to record the weight. The subjects were instructed to stand on the weighing scale with light clothing, without footwear,

with feet apart and looking straight. The height, weight, date of birth and date of visit of the subject were then entered in the *WHO Anthroplus software* to obtain the Z score and percentile value for the parameters *weight for age, height for age and BMI for age.* A detailed clinical examination of the children was also done, and co morbidities if any were recorded. The GPS coordinates of the schools (location in relation to latitude and longitude) were recorded using the Garmin 72H GPS receiver in terms of __° __' N and __°__' E. A sub sample (10%) of the malnourished children (selected randomly) were visited at their household to record the GPS coordinates of their household. The GPS coordinates of the household and schools were entered into the google earth software to generate the spatial map.

The data was entered in Microsoft Excel-10 and analyzed using SPSS v.21.0. Z test was used to test the difference in the distribution of malnutrition between sexes. Chi Square test was used to test the association between co morbidities and malnutrition. Kruskal Wallis test was used to test difference of Z scores and percentiles of BMI for age, height for age and weight for age between age groups. Mann Whitney test was used to test the difference of Z scores and percentiles of BMI for age, height for age and weight for age between sexes. Correlation was also tested between age and Height for age Z score (HAZ), BMI for age Z score (BAZ), Weight for age Z score (WAZ).

Results

A total of 2730 children (1380 males and 1350 females) were examined. Overall 64.2% were found to be normal, 9.1% were found to have severe thinness, 20.9% thinness, 4.4% overweight and 1.4% obesity (table I).Severe thinness was found to be highest among 12 years i.e., 12.1%, thinness among 10 years i.e., 24.9%, overweight among 14 years i.e., 8.4% and obesity among 11, 14 and 15yrs i.e., 1.8% (table I). Thinness and severe thinness were higher among males (24.2% and 12.5%) compared to females (17.6% and 5.6%), whereas normal category, overweight and obesity were higher among females (5.1% and 1.5%) compared to males (3.8% and 1.2%) and the difference of BAZ between sexes was found to be statistically significant for severe thinness, thinness and normal categories (P<0.01,<0.01 and <0.01) and not significant for overweight and obesity (P = 0.09 and 0.46) by Z test.

Table I: BMI for age Z score (BAZ) categories – comparison between ages

Age (years)	BMI for age Z score category					Total
	<-3SD (Severe thinness)	-3 to < -2SD (Thinness)	-2 to +1SD (Normal)	>+1 to +2SD (Overweight)	>+2SD (Obesity)	
6	23(8.4)	47(17.2)	195 (71.4)	5(1.8)	3(1.1)	273 (100)
7	13(4.8)	65(23.8)	186 (68.1)	6(2.2)	3(1.1)	273 (100)
8	26(9.5)	59(21.6)	176 (64.5)	10(3.7)	2(0.7)	273 (100)
9	27(9.9)	63(23.1)	167 (61.2)	12(4.4)	4(1.5)	273 (100)
10	27(9.9)	**68(24.9)**	163 (59.7)	11(4)	4(1.5)	273 (100)
11	26(9.5)	66(24.2)	165 (60.4)	11(4)	**5(1.8)**	273 (100)
12	**33(12.1)**	64(23.4)	161 -59	13(4.8)	2(0.7)	273(100)
13	32(11.7)	47(17.2)	173 (63.4)	18(6.6)	3(1.1)	273(100)
14	22(8.1)	39(14.3)	184 (67.4)	**23(8.4)**	**5(1.8)**	273(100)
15	20(7.3)	53(19.4)	183(67)	12(4.4)	**5(1.8)**	273(100)
Total	**249(9.1)**	**571(20.9)**	**1753 (64.2)**	**121(4.4)**	**36(1.3)**	**2730 (100)**

Table II: Height for age Z score (HAZ) categories - comparison between ages

Age(yrs)	Height for age Z score category					Total
	<-3 SD (severe stunting)	-3 to <-2 SD (stunting)	-2 to +2 SD (Normal)	>+2 to +3 SD	>+3 SD	
6	9(3.3)	33(12.1)	231(84.6)	-	-	273(100)
7	3(1.1)	48(17.6)	221(81)	1(0.4)	-	273(100)
8	10(3.7)	38(13.9)	224(82.1)	-	1(0.4)	273(100)
9	5(1.8)	39(14.3)	227(83.2)	2(0.7)	-	273(100)
10	6(2.2)	41(15)	226(82.8)	-	-	273(100)
11	12(4.4)	42(15.4)	219(80.2)	-	-	273(100)
12	**16(5.9)**	**56(20.5)**	201(73.6)	-	-	273(100)
13	14(5.1)	50(18.3)	209(76.6)	-	-	273(100)
14	5(1.8)	52(19)	216(79.1)	-	-	273(100)
15	13(4.8)	36(13.2)	224(82.1)	-	-	273(100)
Total	**93(3.4)**	**435(15.9)**	**2198 (80.5)**	**3(0.1)**	**1(0)**	**2730(100)**

Overall median BMI for age percentile (BAP) was 7.70. Median BAP was highest for 14 years children (14.90) and lowest for 10 years children (5.60). The difference of BAP between ages was found to be statistically significant by Kruskal Wallis test (χ^2=45.232, P=0.001). Median BAP was higher among females (11.70) compared to males (5.40). The difference of BAP between sexes was found to be statistically significant by Mann Whitney test (Z= -9.027, P=0.001).

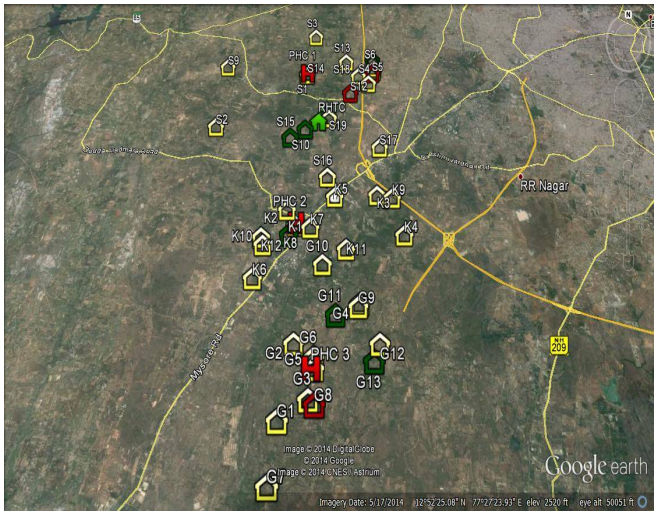
Table III: Weight for age Z score (WAZ) categories –comparison between ages

Age (yrs)	Weight for age Z score category					Total
	<-3 SD (severely Underweight)	-3 to <-2 SD (Underweight)	-2 to +2 SD (Normal)	>+2 to +3 SD	>+3 SD	
6	20(7.3)	63(23.1)	188(68.9)	2(0.7)	0(0)	273(100)
7	**22(8.1)**	81(29.7)	169(61.9)	0(0)	1(0.4)	273(100)
8	**22(8.1)**	**88(32.2)**	163(59.7)	0(0)	0(0)	273(100)
9	**22(8.1)**	75(27.5)	174(63.7)	2(0.7)	0(0)	273(100)
10	0(0)	4(30.8)	9(69.2)	0(0)	0(0)	13(100)
Total	**86(7.8)**	**311(28.1)**	**703(63.6)**	**4(0.4)**	**1(0.1)**	1105 -100

Figures in parentheses indicate percentage within age group

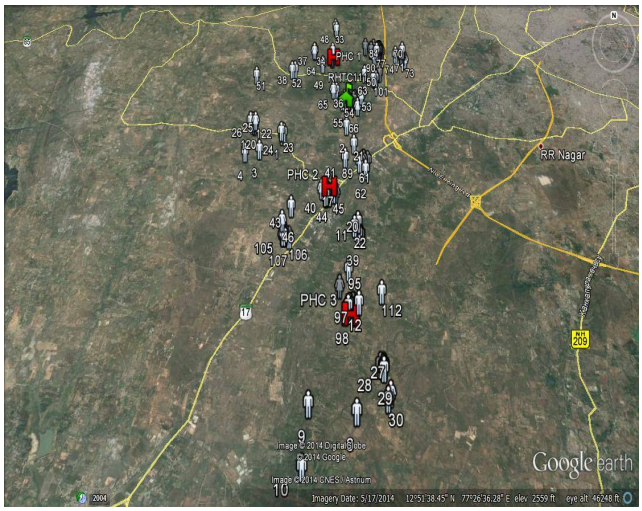
Note: WHO - Weight for age reference is available from birth only till 10 years 0 months (not from 10 years 1 month onwards) because Weight for-age is inadequate for monitoring growth beyond childhood due to its inability to distinguish between relative height and body mass, hence BMI-for-age should be used as complement to height-for-age in the assessment of thinness (low BMI-for-age), overweight and obesity (high BMI-for-age) and stunting (low height-for-age) in school-aged children and adolescents.[3] Hence weight for age was computed for only 1105 children.

Picture 1: Spatial map using GPS and google earth showing prevalence of malnutrition across schools



As per the height for age Z scores (HAZ), 3.4% were found to have severe stunting and 15.9% stunting. Both severe stunting and stunting were found to be highest among 12 years i.e.,5.9% and 20.5% respectively (table II). Severe stunting was observed in 3.4% of males and females. Stunting was more among females compared to males i.e., 17% and 14.9% respectively. The difference of HAZ categories between sexes was not found to be statistically significant for all categories by Z test (*P*=1, 0.11876, 0.14986, 0.57548, 0.3125 respectively for severe stunting, stunting, normal,>+2 to +3SD and >+3SD categories).[table II to come after this]

Picture 2: Spatial distribution of households of malnourished children in the study area obtained using GPS and google earth



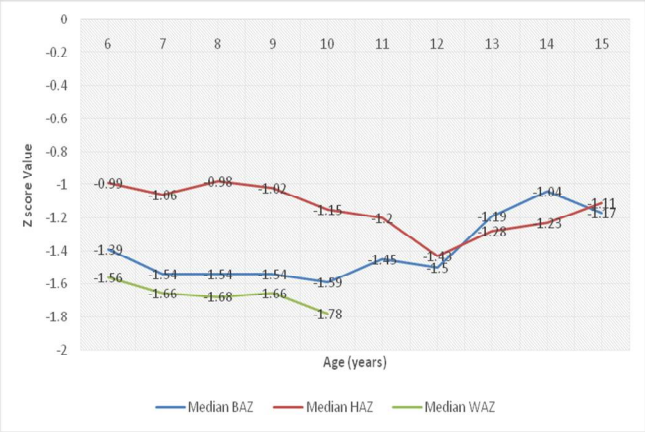
Picture 2 is a zoomed out view at a height of 46248 ft from the ground level and gives an overall picture about the spatial distribution of households of malnourished children in the study area.

Overall median Height for age percentile (HAP) was 12.70. Median HAP was highest for 8 years children (16.20) and least for 12 years children (12.60). The difference of HAP between ages was found to be statistically significant by Kruskal Wallis test (χ^2=54.49, *P*=0.001).Median HAP was higher among males (12.85) compared to females (12.4) and the difference of HAP between sexes was found to be statistically not significant by Mann Whitney test (Z= -0.977, *P*=0.328).

As per the weight for age Z scores, 7.8% were found to be severely underweight, and 28.1% underweight. Prevalence of severe underweight was highest among 7, 8 and 9 years i.e.,8.1% each and underweight among 8 years i.e., 32.2% (table III). Prevalence of severe underweight was higher among males (9.5%) compared to females (6.1%) and underweight was higher among females (29.3%) compared to males (27%). The difference of WAZ categories between sexes was not found to be statistically significant for all categories except for severe underweight category by Z test (*P*=0.036, 0.407, 0.841, 0.322 and 0.322 respectively for severe underweight, underweight, normal, >+2 to +3 SD and >+3 SD categories).[table III to come after this]

Overall median Weight for age percentile (WAP) was 5.00. Median WAP was highest for 6 years children (6.00) and least for 10 years children (3.70). The difference of WAP between ages was found to be statistically not significant by Kruskal Wallis test (χ^2=0.853, *P*=0.931).Median WAP was higher among females (5.50) compared to males (4.50). The difference of WAP between sexes was found to be statistically not significant by Mann Whitney test (Z= -1.562, *P*=0.118).

Graph 1: Comparison of medians of BMI for age Z score(BAZ), height for age Z score (HAZ), and weight for age Z score (WAZ) across ages



Graph 2: Comparison of medians of BMI for age pecentile (BAP), height for age percentile (HAP), weight for age percentile (WAP) across ages

Picture1 is the spatial map using GPS and google earth displaying the prevalence of malnutrition across different schools and picture 2 is the spatial map showing the distribution of households of malnourished children in the study area.[picture 1 and picture 2 should come after this]

There was a weak positive correlation of age with BAZ (r = +0.091) and weak negative correlation of age with HAZ (r = -0.099) and WAZ (r = -0.019). All these correlations were found to be statistically significant (P=0.001) except that between age and WAZ (P=0.538) . Coefficient of determination (r^2) values 0.008, 0.010 and 0.0004imply 0.8%, 1% and 0.04% change in BAZ, HAZ and WAZ respectively can be attributed to age.

The most common comorbidities among malnourished children were dental caries/ oral conditions (28.2%), followed by URTIs (13.4%), skin diseases (6.3%) and anaemia (5.3%). A total of 717 out of 1227 malnourished children had comorbid conditions as against 774 out of 1503 normal children (and the difference was found to be statistically significant (*P*=0.0003) by Chi Square test. The odds ratio was found to be 1.324.

Graph 1 compares the *medians* of BAZ, HAZ and WAZ across ages. There is no significant net change in median BAZ between 6-10 years (the curve runs more or less parallel to the X-axis). And from 10 years onwards there is a gradual rise till 15 years. HAZ curve shows a gradual decrease till 12 years followed by a gradual rise till 15 years. WAZ curve runs more or less parallel to HAZ curve showing a gradual decrease till 10 years. In the graph 2 *medians* of BAP, HAP and WAP are compared across ages which also show a similar finding.[graph 1 and 2 should follow this]

Discussion

Conventionally the measurements of the children had to be plotted against age in months, in 3 separate WHO growth charts (BMI for age, height for age and weight for age) manually. This could only give the category of the Z score (i.e., underweight, stunting etc.,) and percentile (i.e., below 3rd percentile, between 3rd to 97th percentile etc.,) grossly but not the exact Z score and percentile value. Also BMI had to be computed by the researcher for each subject and then plotted on to the growth chart which would be a tedious task. The advantage of WHO anthroplus software apart from being standardized, is that it allows computation of the exact Z score and percentile values for all these parameters instantaneously, on entry of height, weight and age of the subject. The Z score and percentile values help in comparison between individuals and also interstate and international comparisons. These values will also help in

assessing the improvement/deterioration in the nutritional status with time both at individual level as well as state and national levels. The software is freely downloadable from the WHO website.

In this study the prevalence of thinness was found to be similar to the findings of few other studies where the prevalence of thinness was found to be 28.3%, 34.3% and 33.4%.[8,9,10] On the contrary another study reported the prevalence of thinness as 5%.[11]The probable reason for the difference could be because all the children in the latter study were from urban background contrary to our study and also differences in the age groups. In this study the prevalence of overweight/obesity was found to be 5.8% which is in contrast to other studies where it was found to be 1.3%, 1.7 %, and 0.8% [8,9,10]. The reason for this difference could be the difference in age groups and different sociocultural backgrounds of the study subjects as well as different reference standards used in these studies. Kamath et al., reported the prevalence of overweight/obesity as 3.3%. They also noted the prevalence of thinness was more among boys (6.9% in boys and 3.9% in girls) and overweight/obesity among girls (3.6% in girls and 3% in boys) similar to our study.[11] In this study one third of the children were found to be underweight which is similar to the findings of another study where the prevalence was 34.2%[9] which is in contrast to other studies contrast where the prevalence was 24.5% and 3.6%.[12,13] The reason for this difference could be the difference in age groups and ethnicities of the study subjects and also different reference standards used. In this study one fifth of the children were found to have stunting which was similar to the findings of other studies, 18.5% and 23.7%.[2,10] In contrast other studies reported the prevalence of stunting as 3.3% and 6.4%.[13,14] The difference could be due the differences in the ethnicities as well as age groups of the study subjects.

In this study GPS was used to visually depict the schoolwise prevalence of malnutrition as well as location of the households of the malnourished children. This information can be used to assess the factors responsible for malnutrition at schools as well as households (like socio economic background of the children attending the schools, coverage by school health services, quality of midday meals, poor road connectivity, topography, distance to health centre etc,) and also in better planning of intervention strategies (with respect to manpower , logistics etc.). The advantage of spatial map constructed with GPS technology and google earth is that information is available visually and data can be saved permanently to be retrieved latter at any point in time for cross checking or comparison and trend analysis.[15]

A study by Saxena et al., revealed that GPS data could be used for mapping out the distribution of malaria vector mosquitoes, along with monitoring and evaluation of malaria control activities in various countries and also for risk mapping in analyzing the past as well as the present trends.[16] Coburn et al., used GPS data to show the geographical distribution of HIV infected patients and observed that this data could be used to implement the rollout of treatment as prevention in an efficient manner.[17] Masthi et al.,have used GPS to accurately describe the distribution of anemia and malnutrition cases, animal bite cases and Cholera cases in an outbreak of Cholera at the field level and have observed that GPS was a useful tool in mapping the morbidities at the field level.[5,18,15]

The prevalence of underweight, stunting and thinness were higher compared to overweight/obesity in the study subjects. WHO Anthroplus software was easy to use and very useful in assessment of nutritional status of children accurately. GPS with google earth was very useful in the construction of the spatial map showing distribution of malnourished children accurately, and there was significant association between malnutrition and comorbid conditions. Hence The WHO Anthroplus software may be used as an effective tool to assess the nutritional status of school age children and adolescents and GPS/google earth may be used to describe the geographical distribution of malnutrition accurately at the field level.

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Original Research Article

KNOWLEDGE, ATTITUDES, AND PRACTICES OF MOTHERS REGARDING BREASTFEEDING: A CROSS SECTIONAL STUDY IN SELECTED RURAL AREA OF MANDYA DISTRICT, KARNATAKA

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Abstract

Background: Breastfeeding is the safest, economic and the best way to provide infants with the nutrients they need. The prevalence of exclusive and adequate breastfeeding practices is still lower in many countries. Inadequate knowledge and inappropriate practice of breastfeeding is a major issue and it may cause undesirable consequences. Objective of this study is to assess the knowledge, attitude & practices regarding breast feeding among lactating mothers having children <= 1 year in Keregodu PHC area and to study the determinants of breast feeding practices in the study area.**Methods:** Community based cross sectional study was conducted in the field practice area of Rural Health Training Centre, Keregodu. 104 mothers from 4 sub centres having children ≤1year age group were included in the study. Semi-structured questionnaire was used to collect the information. **Results:** The study revealed that all the 104 (100%) children were breastfed. But only 33 (31.7%) had the knowledge about exclusive breast feeding. Attitude towards exclusive breastfeeding was favourable 95 (91.3%). Only 14 (13.5%) were practising demand feeding. **Conclusion:** Mothers had poor knowledge, but favourable attitude regarding exclusive breastfeeding practices. But there is a gap between attitude and practice which needs to be addressed. So pregnant women need to be made aware of benefits of breastfeeding and proper feeding techniques during antenatal period.

Keywords: Breast Feeding, Knowledge, Attitude, Practice, Rural Area

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INTRODUCTION

Breast feeding is crucial for the growth and development of the infant. Breast milk is the ideal food and it gives all the nutrients need for healthy development for new born and infants. Breast milk is readily available, economical and safe. It is the best and first food for all infants. It contributes to a lifetime of good health and who were breastfed as babies are less likely to be overweight or obese and it also reduces infant morbidity & mortality. Breastfeeding also benefits mothers in many ways. It is a natural act, but it has to be learned.[1,2]

Malnutrition is very common and major public health problem in the developing countries especially among children. Under nutrition is associated with 45% of child deaths. About 43% of infants 0–6 months old are exclusively breastfed. Over 800 000 children's lives could be saved every year among children under 5 years, if all children 0–23 months were optimally breastfed.[3]

In India, only 44.6% mothers initiate breastfeeding within one hour of birth in spite of the fact that about 78.7% deliver in institutions. Further 64.9% babies are exclusively breastfed during first six months (RSOC, 2014).[4] According to NFHS3

exclusive breast feeding is 50% and 25% initiated breast feeding within one hour.[5]

Exclusive breastfeeding for the first six months of life is the recommended way of feeding infants, followed by continued breastfeeding with appropriate complementary foods for up to two years or beyond to meet the growing needs of babies. WHO and UNICEF recommend very important criteria of breast feeding like initiation of breastfeeding within the first hour of life, exclusive breastfeeding, demand feeding and no use of bottles, teats or pacifiers.[6] One of the most significant ways to improve infant survival rates is early, timely and exclusive breastfeeding. Malnutrition starts at the infancy itself, if the infant do not get sufficient nutrients in the early life.

Exclusive breast feeding can take care of new born nutrition and infection control. In India, the rates of early initiation, exclusive breastfeeding are far from desirable.[9,17] A lot of factors ranging from customs, practices education of parents and support from family play an important role in successful breastfeeding practices. Through this study aim at the knowledge, attitude and practices of mothers regarding breast feeding, this information will help in devising specific interventions to promote breastfeeding rates and also we can assess the work done by health workers in this field. Breast feeding not only improves child development but also reduce health costs results in economic gains for the family.

OBJECTIVES: 1. To assess the knowledge, attitude and practices regarding breast feeding among lactating mothers having children < =1 year in Keregodu PHC area, 2. To study the determinants of breast feeding practices in the study area

MATERIAL & METHODS

Study Area: A study was conducted amongst mothers having children between 0-12 months of age group in the field practice area of Rural Health Training Centre (RHTC) of Department of Community Medicine, Mandya Institute of Medical Sciences, Mandya which caters to a population of about 8632 according to Census 2011 information.

Study design: Cross sectional study

Study period: 1st August 2016 to 31st November 2016 (4months)

Sample size: 104 -47 were from Keregodu A, 26 were from Keregodu B, 12 were from Marlinganadoddi and 19 were from Kalmandidoddi.

Inclusion criteria: All lactating mothers having children ≤ 1 year in the study period who gave informed consent.

Analysis: Data entered into Microsoft Excel and analysed using descriptive statistics like percentages as well as inferential statistics like chi-square test

Study tools: A pre-tested semi-structured questionnaire with a total of 35questions -which was prepared for assessing knowledge, attitude and practice of mothers on breastfeeding. Most of the questions were prepared on the questionnaire used in World Health Organization KAP survey[6]. The first set of questions asked about demographics, followed by a set of questions about the knowledge, attitude and practices of exclusive breastfeeding.

Approval: Institutional Scientific and Ethical Committees approvals were taken before the commencement of the study.

Method of data collection: After obtaining Institutional Ethical Clearance from our college, a house to house survey was conducted by the researcher herself and administered the pre-tested semi-structured questionnaire. Informed written consent was taken from each of the participants. All lactating mothers having children less than one year in 4 sub-centres under Keregodu PHC were included in the study. Those who refuse to give informed consent, mothers not available during study period and all lactating mothers having children >1 year of age were excluded from the study. The study was carried out for a period of 4 Months i.e. August 2016 to November 2016. Data entered into Microsoft Excel and analysed using descriptive statistics.

RESULTS

Total 104 lactating mothers having children ≤ 1 year participated in the study. On analysis of socio demographic profiles of the mothers majority 96 (92.3%) were Hindus followed by Muslims 8 (7.7%). Half of the participants 53 (51.0%) were in the 21-25 year age group with the mean age 25.43

and standard deviation of 3.926. 94 (90.4%) were house wives. Majority 46 (44.2%) hailed from Nuclear families and rest of them were equally from joint and three generation families.

According to Modified BG Prasad Classification (Updated in April 2016) 41 (39.4%) belonged to Class 2 and 34 mothers (32.7%) belonged to socioeconomic class 3. Only 2 (1.9%) were illiterate. Among 104 children, 64 (61.5%) were male and 40 (38.5%) were female babies. 99 (95.2%) were term babies. Primiparous mothers accounted for 63 (60.6%). 3 (2.9%) had more than two children. Most of them 62 (59.6%) delivered by caesarean section. Out of 49 who delivered in private set up, 39 were caesarean section (P value 0.00). Only 12 (11.5%) used contraception before the present child and 18 (17.3%) after the present child birth.

Table 01: Distribution of study participants according to knowledge regarding breastfeeding

Characteristic	Number	Percentage
Pre-lacteal feeds are not good	34	32.7
Colostrum is essential for babies health	95	91.3
*Start breastfeeding within 1 hour after delivery	39	37.5
Give only breast milk for first 6 months	33	31.7
Burping should be done after each feed	93	89.4
*Breast feed on demand	14	13.5
Child needs vitamin syrup during first 6 months	73	70.2
Child <6months require water during summer season	57	54.8
*Breast feeding helps in mother and child bonding	100	96.2
*Breast feeding can prevent diseases affecting breast	91	87.5
*Breast feeding should be continued up to 2 years	43	41.3

Table 02: Attitude of the study participants towards breastfeeding

Characteristic	Number	Percentage
I think I should breast feed my child in the night	95	91.3
According to me breastfed babies are healthier than formula fed babies	76	73.1
*I think during breastfeeding the mother should sit comfortably	32	30.8
I think I should not feed if my child is sick	30	28.8
I think breastfeeding affect my beauty	24	23.1
I think it is better to stop breastfeeding when I start weaning	21	20.2
According to me formula feeding is more convenient than breastfeeding	8	7.7

*Multiple responses

Breastfeeding knowledge of the participants was assessed. 34 (32.7%) knew that pre-lacteal feeds are not good for their babies and 95 (91.3%) participants reported that colostrum is important and essential for babies health. Majority of them were not aware of the benefits of breast feeding for them. 40 (38.5%) aware that breastfeeding benefits for mothers too. 14 (13.5%) knew that baby should be breast feed on demand, not on regular intervals. 100 (96.2%) knew breastfeeding helps in mother and child bonding. 103 (99%) knew that breast feeding is important for the health of the infants. 33(31.7%) had the correct knowledge about the duration of exclusive breast feeding. Only 32 (30.8%) knew the correct feeding position- sitting position- to feed their child. (See Table1)

21 (20.2%) believes that they should stop breast feeding when they start with other foods ie. complimentary feeding.

Regarding the breastfeeding attitude of the participants, 76 (73.1%) said breast fed babies are healthier than formula fed babies. 95 (91.3%) accepted that they have to feed the child in the night. 8(7.7%) think that formula feeding is more convenient than breast feeding. Majority of participants 95 (91.3%) intended to breastfeed exclusively their future children. (See Table 2)

Table 03: Distribution of study participants according to various breastfeeding practices

Pre-lacteal feeds	Number	Percentage
Given	14	13.5
Not given	90	86.5
Colostrum		
Given	95	91.3
Not given	9	8.7
Practice of time of starting breast feeding		
Not remembering	2	1.9
<1Hour	8	7.7
1hrs -24 hrs	44	42.3
1day-5days	38	36.5
>5days	12	11.5
Used feeding bottles to feed the child		
Yes	18	17.3
No	81	77.9
Not answered	5	4.8
Frequency of Breastfeeding		
On demand	14	13.5
At regular intervals	90	86.5
Supplementary feeding started		
Before completing 6months of age	8	7.7
After 7 months	34	32.7

Assessing the breastfeeding practice of the participants, all children 104 (100%) were being breast fed. Our study pointed out that 08 (07.7%) babies born were breast fed within first hour of life of which 05 (62.5%) were male and 03 (37.5%)

were female babies (See Table 3). 7 (6.7%) of mothers discontinued breast feeding due to various reasons. Most important reason given by the mothers was insufficient milk. Burping was practiced by 93 (89.4%). Table No.4 depicts relation between type of delivery and time of starting breast feeding.

Table 04: Distribution of the study participants according to type of delivery and time of starting breast feeding

Type of delivery	<1hour	1hour-24hours	1- 5 days	>5days	Not remembering	Total	Chi square value 9.114 with 4 d.f; 0.058
Vaginal	5	22	13	1	1	42	
LSCS	3	22	25	11	1	62	
Total	8	44	38	12	2	104	

Table 05: Distribution of the study participants according to the education and knowledge about exclusive breast feeding

Level of education	Do not know	<6 months	6 months	>6 months	Total	P value
Illiterate	0	2	0	0	2	Chi square value 50.444 with 12 d.f; 0.000
Primary School	0	1	1	3	5	
High School	2	1	11	12	26	
College/Pre-university	0	1	14	29	44	
Graduate and Above	1	0	7	19	27	
Illiterate	3	5	33	63	104	

Table 06: Distribution of the study participants according to religion and time of starting breast feeding

Religion	<1hour	1hour-24hours	1-5days	>5days	Not remembering	Total	P value
Hindu	7	41	35	11	2	96	Chi square value 0.484 with 4 d.f; 0.975
Muslim	1	3	3	1	0	8	
	8	44	38	12	2	104	

Among 90 (86.5%) mothers were not given pre-lacteal feed. Among these, 34(32.7%) mothers had the correct knowledge that pre-lacteal feeds are not good and should not be given to the child. Rest of the mothers were lacking this knowledge, but not given pre-lacteal feed. It may be due to the involvement of hospital staffs. 95 (91.3%) had the knowledge that colostrum is essential for the health of the child and the same participants had given colostrum to the child. Among 14 (13.5%) who had given pre-lacteal feed, 09 (08.7%) discarded colostrum thinking that it is bad for the child.

59 (56.7%) mothers received advice on breastfeeding from family members especially from mothers during antenatal period and only 14 (13.5%) received advice from health care workers. (As seen in Fig:01)

Fig 01: Source of breastfeeding information as received by the study participants during their antenatal period/postnatal period

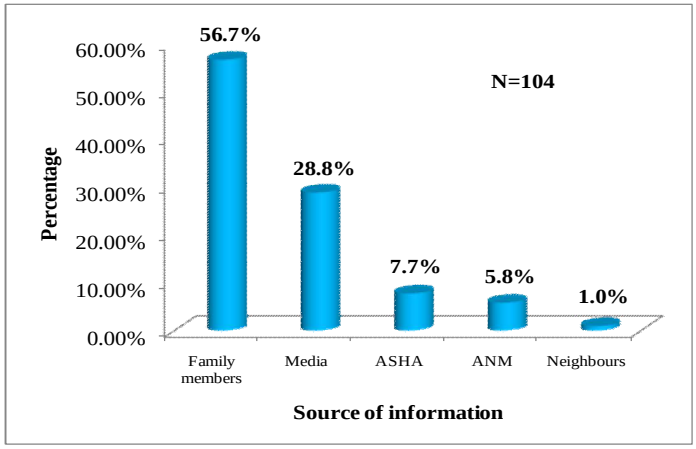

Fig 02: Reasons for bottle-feeding as given by the study participants

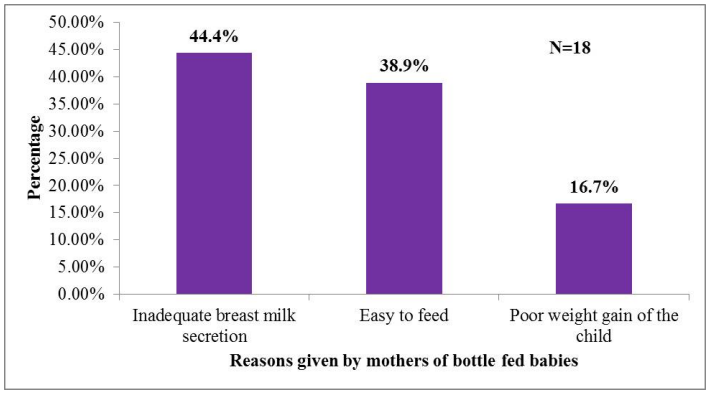

Figure 2 shows the reasons for bottle-feeding, where most of the mothers inferred that the main reason for giving bottle feed is because of inadequate breast milk 8 (44.4%). Other reasons were—easy to feed 7(38.9%) and poor weight gain of the child 3(16.7%)

Our study found education of mothers and knowledge about exclusive breast feeding to be statistically significant. (P<0.001) (See Table 6) The knowledge of exclusive breast feeding was seen increasing with educational status of mother .It was

seen in mothers who were graduated 07(25.9%), college education/pre-university education 14(31.8%), high school educated 11(42.3%) and primary school 1(3.03%).

Our study finding with regard to demand feeding practices and religion was as follows. Of the total mothers, 96 (92.3%) who were Hindus by religion only 14(13.5%) practiced demand feeding of 08 (07.7%) mothers who were Muslims by religion, no one practiced demand feeding. However this difference was not found to be statistically significant. ($p > 0.05$). Also data was further analysed for early initiation of breast feeding and religion of the mother the difference was not found to be statistically significant. 07 (87.5%) mothers of Hindu religion and 01 (12.5%) of Muslim mothers started breast feeding within one hour of delivery. (See Table 6)

Practice of demand feeding by type of family. The study shows that 5 (17.2%) of mothers belonging to joint family practiced demand feeding whereas only 6 (13.0%) from Nuclear family practiced demand feeding however this difference was not found to be statistically significant ($p > 0.05$)

The practice of demand feeding is seen increasing with educational status of mother. Demand feeding practice is seen more in mothers who were educated minimum secondary. Illiterate mothers were not practiced demand feeding and this difference was not found to be statistically significant. ($p > 0.05$)

In our study the number of siblings of children did not have any effect on practice of demand feeding. 08 (12.7%) of children having no sibling were fed on demand whereas 8 (13.2) % having one sibling had demand feeding and 1(33.3%) of children with three or more siblings were on demand feeding.

DISCUSSION

In the present study 102 (98%) of the mothers who participated were literate but their knowledge about early breastfeeding was poor 39 (37.5%). This is not compatible with the study finding observed in the study conducted by Chinnasami B et al[8.] Although the first hour feeding rates was less most of the babies 44 (42.3%) were breastfed with in the first 24hrs (Table 02) .This finding matches well with the study done by Shaili V[8] and Harnagle R et al[10]. Our study depicted that 95 (91.3%) respondents fed colostrum to the child as observed in the study by Kumar A et al[11].

There should be active support for establishing and sustaining appropriate breastfeeding practices. So preparation of mothers with adequate information before they give birth is very important. However in our study we found that only 14 (13.5%) of the women received advice on breastfeeding during antenatal period from healthcare workers. 56.7% got advice from family members, which may not be sufficient (Fig01). This result is not compatible with the study done by Jain U, where majority of mothers (57.89%) got information about exclusive breast feeding from doctors[12].Support and counselling should be available routinely during ante-natal care for the preparation of mothers for giving birth and to help them to initiate early and exclusive breastfeeding.

In our study colostrum was given by 91.3% mothers. Colostrum has been considered bad by 8.7% of mothers and 13.5% have given prelacteal feeds like sugar, honey etc. This finding was similar to the results found in the study done by Tiwari V et al [13]. CS section was more among mothers aged more than 30 years (P value .001).

WHO strongly recommends 6 months of exclusive breastfeeding for infants .But, in our study only 33 (31.7%) knew that exclusive breastfeeding should be given for 6 month. These findings well match with the study done by Maheswari E et[14] al and Sunil K et al[15]. Lack of knowledge is the main reason for this practice than poverty .This inadequate practice can make the child prone for diarrhoea and other diseases. 63 (60.6%) believe that exclusive breast-feeding to be more than six months, and this is a major reason for malnutrition among children[16]. So the importance of timely and adequate introduction of supplementary feeds needs to be stressed among mothers. Similarly, 43 (41.3%) mothers in the current study felt that they should continue breastfeeding till the age of 2 years. This percentage is less than what was observed in the study by Vijayalakshmi P et al[17]

It was observed that only 14 (13.5%) lactating mothers fed their babies on demand, this was low in comparison to Sunil K et al[15] and Madhu K et al where 84% mothers practiced demand feeding to the babies[18].

In our study mothers aged between 21 to 25 years were practising exclusive breast feeding compared to other ages. Early breastfeeding and demand feeding were practised more by mothers who educated higher secondary or above (Table 03) as observed in the study by Debadeep K et al[19] and low birth weight babies were less among these educated mothers (Table 04) and mothers belongs to middle and high socio economic status(Fig 03).

CONCLUSSION: It is evident from above results that there is lack of knowledge and faulty practices among mothers in infant feeding. Poor knowledge of mothers about exclusive breastfeeding is a matter of great concern, because these practices substantially going to affect the health of the child. So there is a need for the urgent intervention to implement local educational programs for women of child-bearing age. The information regarding the advantages of breast feeding should be emphasized because most of the malpractices can be prevented by proper and timely education. Practices such as late initiation of breast feeding and early/ late weaning should be discouraged. For this there should be proper counselling and preparation of breast feeding for women during the antenatal period itself. There should be proper support for lactating mothers from family and community. It will help them to initiate early breast feeding and also to avoid malpractices due to ignorance. We also recommend strengthening of the community-based health education programs to promote exclusive breast feeding. Proper training should be given to the health workers-especially ASHA, ANM etc.

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Original Research Article

A KAP Study on Family Planning Practices Among Married Women Attending Urban Health Training Centre, Narayana Medical College, Nellore (A.P)

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Abstract

Background: In1951, India became the 1st country in the world to launch family planning programme. Since then approaches for reducing population growth have taken a variety of forms but with a little success. According to National Population policy2000 the TFR to be achieved by 2010 was 2.1.**Objectives:** To study the knowledge, attitude and practices regarding family planning among the married women attending the urban health training centre of Narayana medical college, Nellore. **Methodology:** The study is conducted over a period of 3 months from Oct.2016 – Dec.2016 on 170 married women attending UHTC, NMC, Nellore and who were willing to be interviewed. The study tool is a pre-designed, semi-structured questionnaire. Data collected will be entered in MS-Excel and analysed using SPSS version 22.0. **Results:** Among the 170 married women the results were as follows: 50% were in the age group of 20 -29 years, 22.4% were illiterates. 75.3%women were home makers. 38.8% were married below the age of 18 years. While 67% of the women completed their families, 51.2% had 1 living son. 69% were aware of family planning. Almost 52% said decisions regarding family planning were made by husband & in-laws. There was significant association between awareness regarding family planning with age of the women, caste, education and occupation of the women, and also age at marriage and age at 1st delivery. **Conclusion**: awareness regarding family planning should be improved. Women should be given free hand regarding decisions concerning family planning.

Key words: KAP, Family planning, married women

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Introduction

Family planning is defined by WHO as "a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attitudes and responsible decisions by individuals and couples, in order to promote the health and welfare of family groups and thus contribute effectively to the social development of a country"[1]. India is the second most populous country of the world and is projected to become the most populous country in the world surpassing China by 2040.Family planning is the need of the hour to prevent this major disaster. In1951, India became the 1st country in the world to launch family planning programme[2]. Since then approaches for reducing population growth have taken a variety of forms but with a little success. The department of family welfare, undertook activities aimed at addressing the needs of women who were at risk of unwanted births and also fertility decline. According to National Population policy2000 the TFR to be achieved by 2010 was 2.1[2]. India, being a multicultural and multilinguistic country beliefs and practices regarding family planning vary from place to place and this certainly plays a major role in the attitudes & practices of people, concerning family planning.

Objectives:

1. To study the knowledge, attitude and practices regarding family planning among the married women attending the urban health training centre of Narayana medical college, Nellore. 2.To study the reasons for not practicing contraception in the above said population. 3.To study the association of certain demographic variables with awareness regarding family planning in the above women.

Methodology:

Institutional Ethics Committee approval was obtained. A cross-sectional study was done for a period of 3 months from Oct.2016 – Dec.2016.at the Urban Health Training Centre, Narayana Medical College, Saraswathi Nagar, Nellore, on 170 married women who were attending the health centre during the study period and willing to be interviewed. The study tool was a pre-designed, semi-structured questionnaire on knowledge, attitude and practices of family planning. Data collected was entered in MS-Excel and was analysed using SPSS version 22.0. Percentages and chi-square values were calculated. A p-value of 0.05 or less was considered significant.

Results:

Among the 170 married women who visited the Urban Health Centre, Narayana Medical College, Nellore, and in whom the study was carried out after taking their informed consent verbally.

Table 1: Knowledge of the study subjects regarding family planning. (n = 170)

Variable	Frequency	percentage
Awareness regarding Family Planning		
yes	118	69.4
No	52	30.6
Awareness regarding Family Planning methods		
Not aware	10	5.9
pill	2	1.2
injections	1	0.6
tubectomy	28	16.5
multiple	129	75.9
Source of information		
No information	11	6.5
health personnel	60	35.3
mass media	55	32.4
husband	13	7.6
others	31	18.2

As for the socio-demographic profile, 50% were in the age group of 20 -29 years, 87.1% were Hindus, 47.6% belonged to backward classes, 22.4% were illiterates 53% studied up to high school. 75.3% of the women were home makers and 61.8% belonged to nuclear families. 38.8% were married below the age of 18 years, while 56.5% got married in the 18 – 24 years age group. For 41.8% of them age at 1st delivery was < 20 years and for 47.6% it was between 20-30 years. 88.2% said that the desired family size was 2 and 53% of them had an actual family size of 2. While 67% of the women completed their families, 51.2% had 1 living son and 30.6% had no sons at all.

Table 2: Family Planning practices of the study subjects

Variable	Frequency	percentage
Practise Family Planning immediately after marriage (n = 170)		
yes	10	5.9
No	160	94.1
Method (n =10)		
Barrier methods	1	10
OCPs	7	70
Safe period	2	20
Practise Family Planning between successive pregnancies (n =141)		
yes	30	21.3
no	111	78.7
Method (n = 30)		
Barrier method	1	3.33
OCPills	7	23.34
Intra Uterine Devices	19	63.33
Safe period	2	6.67
combined	1	3.33
Permanent sterilization in those who completed family (n = 114		
yes	91	79.8
no	23	20.2
Method (n = 91)		
Tubectomy	88	96.7
Vasectomy	3	3.3

Knowledge regarding family planning was moderate (69%) among the study subjects, (Table1) and none of them knew about implants or injectable contraceptives. Source of information regarding family planning methods for 35% of them were health personnel, followed by mass-media (32.4%).

As far as attitude is concerned, 88.2% of the participants felt that family planning is necessary. Among those who were yet to complete their families, 84.6% said that they would opt for permanent sterilization after the completion of their families and in 52.4% of the study subjects decisions regarding family planning were made by husbands

and in-laws. Only about 16% of the women said they took the decisions by themselves.

Fig.1: reasons cited by study subjects for not adopting spacing methods

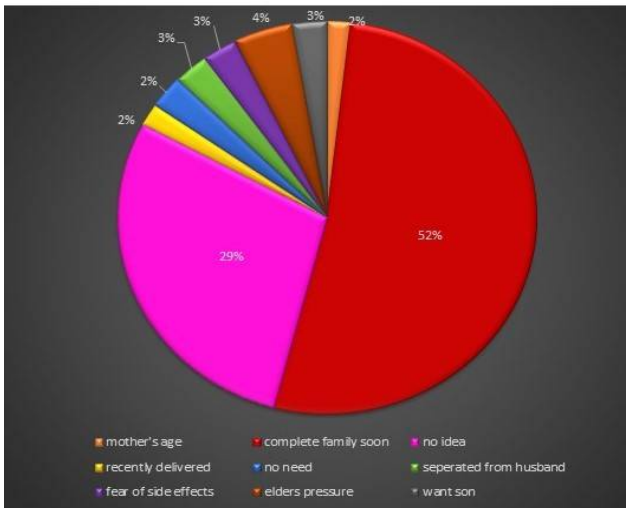
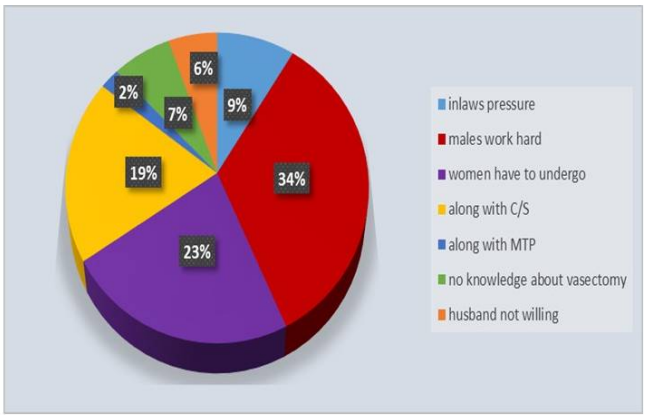


Fig.2: reasons cited by study subjects for not adopting vasectomy as a terminal procedure



When it came to practice of family planning, only about 6% of the study subjects opted for contraception immediately after marriage and among them 70% preferred OC pills. Among the 141 participants who had more than one child, only about 21% practiced spacing and the contraception of choice was intra-uterine device (63.33%). In those who completed their family, almost 80% of them underwent permanent sterilization and the method of choice was tubectomy in 96.7% of them. (Table: 2)

There was significant association between awareness regarding family planning with age of the women (X^2 = 11.939, p0.008), caste (X^2 = 19.116, p=<0.000), education of women(X^2 = 29.212, p=<0.000), occupation of the women (X^2 = 6.626, p=<0.036), age at marriage and age at 1st delivery (X^2 = 7.575, p=<0.023)and(X^2 = 15.432, p=<0.001) respectively.

Discussion

In the present study 69% of the 170 participants were aware of family planning. In a study by Hemavarneshwari[3] et. al in rural Karnataka 92.8% had knowledge about family planning which is similar to the study by RenjhenPrachi[4]et al study where it was observed that 6% of women did not have knowledge about family planning which was very high when compared to the present study. 76% of the subjects in the present study knew about multiple methods. None of them had knowledge about implants and a single subject knew about injectables. This was similar to a study by Hemavarneshwari[3] et. al in rural Karnataka.

In the present study 35% of the participants said the source of information regarding family planning methods was from health personnel followed by mass media which was 32%. A study by Vikas Gupta[5] et al in an urban area of Rohtak, Haryana, the awareness source for family planning methods were mainly doctors/multipurpose health workers/ anganwadi workers (70.4%). In another study by Prachi R[4] et.al in 54.4% of women the source of information was mass media which is also high when compared to our study.

Majority (88%) had right attitude towards family planning in the present study which was similar to a study by Gupta V et al.[5] where it was 83%.Among those who did not complete family, 85% said they were willing for permanent method of sterilization whereas in a study by Prachi R et. al [4] it was 45%.

52% of the participants in the present study said that decisions regarding family planning were taken by their husbands/ in-laws and 16% by the women alone. In a study conducted by Chopra S et al[6], it has been observed that, the decision for contraception was taken together by the husband and wife in 71%, but the woman alone decided in only 4.2% cases. This indicates that the role of women is secondary to the husband in the matters of family planning even in urban India.

In the present study, only 6% of the participants said they did practise family planning immediately after

marriage, i.e. before 1st child birth. Only 21.3%adopted spacing methods between successive pregnancies and among them 63% said they opted for intra-uterine device. In a study by Aleena .N. Mathew[7] et al in Thrissur Dt. of Kerala they noted that 24% had used any family planning method immediately following marriage and this might be due to higher female literacy rates in Kerala. 62.2% in the above study had used family planning methods between consecutive pregnancies, with majority (54.36%) having used intrauterine devices and this was similar to our study.

In the present study, 52% of the study subjects underwent tubectomy, which was almost similar to studies by Alina Ann[5] (48%), Benny[8] et al (58.5%), Pawar Anant9 et .al (50%). In the present study vasectomy was chosen as a limiting method in only 1.8% of the study subjects. Studies by Makade et.[10] al and Reddy S[11] et .al indicate that vasectomy was not practised at all among their study population.

There was significant association between family planning awareness with age of women, caste, education, occupation, age at marriage and age of the women at first delivery. Hemavarshini[3] et al and Sajid[12] et al in their study also found that knowledge is strongly associated with higher level of education. This shows that education plays an important role in family planning acceptance.

Conclusions:

Awareness regarding family planning among the study participants is 69% which is moderate and there is a gap between knowledge and practice of spacing methods. Overall practice of limiting methods is good but acceptance of vasectomy is very poor. In most families women do not have a significant role in family planning decisions.

Recommendations:

Pro-active measures by workers of the urban health training centre in educating the population regarding family planning as a whole, and specifically spacing methods and also encouraging the male population to accept vasectomy as a terminal method. Women should be given the chance to decide freely the choice of contraception, whether for spacing or limiting her family.

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Original Research Article

Prevalence and risk factors of hypertension among adults in Lucknow, India

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Abstract

Background: In India, recent community surveys have documented that prevalence of hypertension has gone up amongst urban and rural inhabitants. A strong association between change in lifestyle and increase in prevalence of hypertension has been reported. **Objectives:** Prevalence of hypertension and identification of associated risk factors amongst adults in rural and urban areas of District Lucknow was studied. **Methods:** The cross sectional field study involved a survey of 753 respondents, aged 18 years and above using stratified random sampling and Probability Proportionate to Size technique. A study instrument which included behavioral risk factor questionnaire and physical measurements of height, weight, waist circumference, hip circumference and blood pressure was used to collect data. Chi- square test and regression analysis were used to analyze data. **Results:** The overall prevalence of hypertension was found to be 25.89%. Prevalence of hypertension was significantly higher among individuals, aged 40 years and above, with high body mass index, increased waist circumference and waist hip ratio and those with high salt intake,(P<.001). Statistically significant associations were also found within people living in urban areas, amongst Muslims and those with higher socioeconomic profile. Also similar associations were found amongst those with high fat intake and adverse food intake, (P<.05). **Conclusions:** Lifestyles do have an impact on levels of blood pressure. This can be tackled by lifestyle modifications.

Key words: Prevalence, Hypertension, Risk factors, Lifestyle modifications

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Introduction

Hypertension is becoming an important public health problem worldwide. It is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries. [(1)]

Reports indicate that nearly 1 billion adults had hypertension in 2000; this is predicted to increase to 1.56 billion by 2025**.** [(2)]

It is the commonest cardiovascular disorder affecting about 20% adult populations worldwide. It is an important risk factor for cardiovascular mortality accounting for 20-30% of all deaths. [(3)]

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by 2020. Hypertension is responsible for 57% of stroke deaths and 24% of coronary heart disease deaths in India**.** [(4)]

Indian urban population studies in the mid-1950s used older WHO guidelines for diagnosis (BP ≥160 and/or 95 mmHg) and reported hypertension prevalence of 1.2-4.0%. Subsequent studies reported

a steadily increasing prevalence from 5% in 1960s to 12-15% in 1990s. [5]

Hypertension prevalence is lower in the rural Indian population, although there has been a steady increase over time as well. Recent studies have shown a high prevalence of hypertension among urban adults. The prevalence of hypertension during the last three to six decades in India has increased by about 30 times among urban residents and by about 10 times among the rural residents**.** [6]

A strong correlation has been reported between changing lifestyle factors (unhealthy diet, physical inactivity, alcohol and tobacco use) and the increase in hypertension. Recently, Chennai Urban Rural Epidemiology Study reported prevalence of hypertension to be 20% as per US Seventh Joint National Committee on Prevention, Detection, Evaluation and Treatment of Hypertension criteria**.** [7]

Ten common risk factors such as unhealthy diet, physical inactivity, smoking, alcohol use, tobacco use, overweight, raised blood pressure, raised total cholesterol levels and raised blood sugar are the most prevalent risk factors among the world population. [8]

The prevalence of hypertension will increase even further unless broad and effective preventive measures are implemented.

The literature on prevalence and risk factors of hypertension in Lucknow was scarce, thereby the present study was undertaken to find out prevalence of hypertension and to identify the risk factors associated amongst adult population aged 18 years and above in field practice areas of the Department of Community Medicine, Era's Lucknow medical college & Hospital, Lucknow.

Material and methods

The cross sectional study was carried out in villages of Kakori block and mohallas of old Lucknow city. Optimal sampling size was calculated on the basis of prior prevalence rate of hypertension of 36.4%. [9] The sample size was calculated by the formula $4PQ/L^2$ where P is the prevalence, Q is 100-P and L is the permissible error i.e.10% of P. Sample size came out to be 750 which was equally divided for urban and rural areas (375 for each). A total of 753 individuals gave consent and participated in the study.

Stratified random sampling was used to select the study subjects. Demographically, the population residing in villages of Kakori block as well as the Mohallas of old Lucknow city have people of different religion, socioeconomic status and other different characteristics. Similar characteristics of people lives in one mohalla/area (strata). So, because of this non homogenous nature of sample, as well as for better representation of each group, stratified sampling was used.

All mohallas and villages in the study area were primary sample units (PSU) i.e. strata. All adults from the PSUs selected formed sampling units. Number of adults to be taken for the survey from each village and mohalla was decided according to Probability Proportionate to Size (PPS) technique. A household wise complete list of eligible sampling unit i.e. adults of age 18 years and above, was prepared separately for all villages and mohallas. Serial numbers were allotted by sequence to the households in each of the list.

Then the first household was selected randomly from Random Number Table and the eligible candidates were taken. Similarly, the next household was randomly picked up and the eligible candidates of that household were taken. This procedure was repeated till the desired numbers of eligible persons were selected. In case of non availability of the adult in selected household due to any reason, next household was selected for the survey in order to attain the adequate sample size. All adults in the final household were covered even if the required number of adults exceeded. The survey was done by the first author himself.

A structured pretested and predesigned questionnaire was used to assess study subjects' self-reported behavioral and lifestyle risk factors for hypertension (Smoked and smokeless tobacco used, alcohol consumed, level of physical activity done and detailed dietary history were recorded), the measurement of subject's blood pressure and anthropometrical parameters.

Following **Operational Definitions** were put to use in the present study:

1. **Hypertension**- means systolic BP $\geq$ 140mmHg and/or mean diastolic BP $\geq$ 90mmHg or history of anti hypertensive treatment fifteen days before the survey.
2. **Current smoking-** someone who in the preceding month of the survey, smoked in any form either daily or occasionally
3. **Non-smoker:** someone who had never smoked at all.

4. **Current smokeless tobacco use**- reported consumption of smokeless tobacco in any form in the preceding month of the survey either daily or occasionally.
5. **Alcohol consumption**- reported consumption of alcohol in the year preceding the survey.
6. **Adverse food intake** was defined as consumption of adverse foods items at least twice a week.
7. **Physical inactivity**- was defined as mostly sitting during working hours and leisure time, using motorized vehicle for travelling and not walking or using bicycle for at least 30 minutes daily.
8. **Overweight/obesity**- body mass index level of > 25 $Kg^{/m2}$ and >30 $Kg^{/m2}$ respectively.

Modified Prasad's classification was applied to measure the individual's socioeconomic status. [10] Questions to assess salt intake were asked to determine the average number of days required to consume one pack of salt by one household as used in another study. [11]

Fat intake was calculated using 24 hour recall dietary survey method amongst individuals. High fat intake was defined as more than 20gms of fat consumed per day both for men and women. [12, 13, and 14]

History of frequency of consumption of adverse foods items such as cheese, butter, fried local foods, red meat, eggs, chicken, fish, aerated soda or sugar, sweetened drinks, pizza, burger, French fries, bakery items, samosa, namkeen etc was also taken. [12]

For physical examination, standardized calibrated mercury column type sphygmomanometer; stethoscope, common weighing machine and measuring tape were used.

During the course of the interview, two measurements of blood pressure on each study participant with a mercury column sphygmomanometer were made using a standardized technique 30 minutes apart in sitting position. [3] The first blood pressure measurement was recorded after obtaining sociodemographic information from the study subject, while the second recorded after a brief clinical examination.

Blood pressure measurements were made on the left arm of each study subject, using a cuff of appropriate size at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which radial pulse disappeared, then deflated slowly at the rate of about 2mm per sec and the readings were recorded to the nearest 2 mm Hg. In case where the two readings differed by over 10 mm of Hg, a third reading was obtained, and the three measurements were averaged. The pressures at which sound appeared and disappeared were taken as systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively.

Blood pressure was classified as normal (SBP <120 and DBP <80 mmHg), pre-hypertension (SBP = 120-139 and/or DBP = 80-89 mmHg), stage I hypertension (SBP = 140-159 and/or DBP = 90-99 mmHg), and stage II hypertension (SBP > 160 and/or DBP > 100 mmHg) as per US Seventh Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC VII) criteria. [15]

Body weight was measured (to the nearest 0.5kg) with the subject standing motionless on the weighing scale, feet about 15cm apart and weight equally distributed on each leg. Subjects were instructed to wear minimum outwear (as culturally appropriate) and no footwear while there weight was being measured.

Height was measured (to the nearest 0.5cm) with the subject standing in an erect position against a vertical surface, and the head positioned so that the top of the external auditory meatus was level with the inferior margin of the bony orbit (Frankfurt's plain).

Body Mass Index was calculated as weight in kilograms divided by weight in meters squared. Based on their BMI, individuals were classified into four groups: thin (BMI <18.5), normal (BMI=18.5-24.9), overweight (BMI = 25.0-29.9) and obese (BMI > 30.0) as per WHO. [16]

Waist circumference was measured with a standard measuring tape, while subjects were lightly clothed, at a level midway between the lower margin of the last rib and iliac crest in centimeters (to the nearest 0.1cm). Waist circumference (WC) cut-offs were taken as 90 cms for males and 80 cms for females to define abdominal obesity using South Asia Pacific Guidelines. [17]

Hip circumference (HC) was measured at the maximum circumference over the buttocks in centimeters (to the nearest 0.1cm) with the subject in standing position.

Waist hip ratio was calculated as waist circumference divided by hip circumference. The cut-off used for the waist-hip ratio (WHR) for males was 0.9 and for females it was 0.8 to define obesity. [18]

Data entry and statistical analysis were performed using the Microsoft Excel and SPSS windows version 14.0 software. Tests of significance like Pearson's Chi- square test, Students t test and ANOVA were applied to find out the results. Univariate logistic regression analysis was done using systolic and diastolic blood pressure as the dependent variable and the various risk factors identified as independent variables. Multiple logistic regression analysis was done using hypertension as the dependent variable and the risk factors found significant as independent variables. The Odds ratios with 95% confidence intervals were calculated to assess the association between the independent variables and hypertension. For testing multi

collinearity, dummy variables were created for each category except the first one that was taken as a reference category. Then the dependent variable from logistic regression analysis was used as a dependent variable in the linear regression. The tolerance was calculated for each independent variable, using the formula, Tolerance = 1 – Rsq, where Rsq is the coefficient of determination for the regression of that variable on all remaining independent variables.

Result

Overall, 195 (25.89%) of 753 respondents studied were hypertensive. The overall, mean blood pressures were 123.39 ± 20.24/79.24 ± 11.61 mm Hg respectively.

Table 1: Hypertension in relation to socio-demographic characteristics

Socio demographic Characteristics	Total (n=753)		Chi-Square (df), P-value
	No. Studied	No. of Hyperten-sives	
Place*			
Urban	380	117 (30.78%)	16.794 (2), **.000**
Rural	373	78 (20.91%)	
Age group (years)*			
18-30	238	24 (10.08%)	54.587 (4), **.000**
31-40	224	60 (26.78%)	
41-50	110	39 (35.45%)	
51-60	100	39 (39.00%)	
> 60	81	33 (40.74%)	
Marital status*			
Married	570	153 (26.84%)	10.732 (2), **0.005**
Unmarried	105	15 (14.28%)	
Divorced/ Evermarried/ Widowed	78	27 (34.61%)	
Religion*			
Hindus	328	63 (19.20%)	13.550 (1), **.000**
Muslims	425	132 (31.05%)	
Socio-economic class			
I	25	10 (40.0%)	9.712 (4) , **0.046**
II	52	15 (28.84%)	
III	104	35 (33.65%)	
IV	346	89 (25.72)	
V	226	46 (20.35%)	
Educational status			
Illiterate	381	99 (25.98%)	14.091 (7), 0.05
Less than primary	46	16 (34.78%)	
Primary	84	17 (20.23%)	
Middle school	66	12 (18.18%)	
High school	60	17 (28.33%)	
Intermediate	38	15 (39.47%)	
Graduate	63	12 (19.04%)	
Postgraduate	15	7 (46.66%)	

*** These significant variables were further included in the logistic regression model**

The prevalence of hypertension was found to be higher in urban areas (30.8%) than rural areas (20.9%) (P-value <.001). The proportion of hypertension showed an increasing trend with age (p-value <.001). Statistically significant associations were found amongst Muslims (P<.001) and those with higher socioeconomic profile (P<.05). [Table 1].

A significantly higher proportion of respondents with a high BMI were found to be hypertensive (51.93%) as compared to those with a normal or low BMI (18%). (P-value <.001) [Table 2].

Highly significant differences in the proportion of hypertension was seen in respondents with an increased waist circumference (54.16% men and 36.03% women) as compared to those with a normal or low waist circumference (17.35% men and 15.46% women), and among respondents with a high waist hip ratio (39.30% men and 30.12% women) as compared to those with a normal or low waist hip ratio (11.90% men and 10.36% women) (P-value <.001). The overall percentage of centrally obese individuals found hypertensive was 40%. [Table 2]

Statistically significant associations were found amongst those with high salt intake (P<.0001) , fat intake (P<.05) and adverse food intake (P<.05). [Table 2]

In urban area, hypertensives had a higher BMI, waist circumference and waist hip ratio. They also more likely consumed a high fat and salt diet and adverse diet as compared to the hypertensives in rural area [Table 2].

Thirty seven out of 133 (27.81%) respondents with current smoking habit (daily) studied were found to be hypertensive as compared to none out of three who smoked occasionally, the difference being statistically insignificant.(P-value >.05) [Table 3]

Univariate logistic regression analysis was done using either systolic blood pressure or diastolic blood pressure as the dependent variable. All variables found significant were further tested in a forward multiple logistic regression analysis. Age, high salt intake, body mass index and waist hip ratio were found to be significant predictors to hypertension in the study population [Table 4].

The study variables in the regression were examined for collinearity. The tolerance came out to be high for each variable. Therefore multicollinearity was not present in the model.

Table 2: Hypertension in relation to modifiable risk factors

Risk factors	Rural (n_1=373)		Urban (n_2=380)		Total (n=753)		Chi-Square (df), P-value
	No. Studied	No. of Hypertensives	No. Studied	No. of Hypertensives	No. Studied	No. of Hypertensives	
Body mass index:*							
<18.5	120	17 (14.17%)	65	2 (3.07%)	185	19 (10.27%)	86.510(3), **.000**
18.5-24.9	196	40 (20.40%)	186	42 (22.58%)	382	82 (21.46%)	
25-30	47	17 (36.17%)	88	50 (56.81%)	135	67 (49.62%)	
>30	10	4 (40.0%)	41	23 (56.09%)	51	27 (52.94%)	
Waist circumference:*							
Men (≥90)	25	11 (44%)	47	28 (59.57%)	72	39 (54.16%)	40.670(1), **.000**
Men (<90)	179	32 (17.87%)	86	14 (16.27%)	265	46 (17.35%)	
Women (≥80)	59	18 (30.5%)	163	62 (38.03%)	222	80 (36.03%)	22.526(1), **.000**
Women (<80)	110	17 (15.45%)	84	13 (15.47%)	194	30 (15.46%)	
Increased Waist hip ratio:*							
Men (>0.9)	90	30 (33.33%)	83	38 (45.78%)	173	68(39.30%)	OR= 4.08 p-value=**.000**
Women (>.08)	119	30 (25.21%)	213	70 (32.86%)	332	100 (30.12%)	
Smoking status							
Smokers	104	22 (21.15%)	32	15 (46.87%)	136	37 (27.20%)	.148(1) 0.7
Non-smokers	269	56 (20.81%)	348	102 (29.31%)	617	158 (25.60%)	
Current smokeless tobacco use:							
Present	90	16 (17.77%)	111	42 (37.83%)	201	58 (28.85%)	1.251(1) 0.263
Absent	283	62 (21.9%)	269	75 (27.88%)	552	137 (24.81%)	
Alcohol consumption							
Present	25	7 (28.0%)	5	2 (40.0%)	30	9 (30.0%)	.274(1) 0.601
Absent	348	71 (20.40%)	375	115(30.66%)	723	186 (25.72%)	
Physical activity							
Sedentary	137	30 (21.89%)	141	52 (36.87%)	278	82 (29.49%)	2.976(2), 0.084
Active	236	48 (20.33%)	239	65 (27.19%)	475	113 (23.78%)	
High fat intake*							
Present	197	51 (25.88%)	275	86 (31.27%)	472	137 (29.02%)	6.453(1), **.011**
Absent	176	27 (15.34%)	105	31 (29.52%)	281	58 (20.64%)	
Salt Intake/day*							
< 5 gm	358	68 (18.99%)	374	112 (29.94%)	732	180 (24.59%)	OR= 7.666 p-value=**.000**
> 5 gm	15	10 (66.67%)	6	5 (83.33%)	21	15 (71.42%)	
Adverse food intake*							
Present	121	28(23.14%)	299	95 (31.77%)	420	123 (29.28%)	5.685(1), **0.017**
Absent	252	50 (19.84%)	81	22 (27.16%)	333	72 (21.62%)	

Table 3: Hypertension in relation to current smoking habit

Current smoking habit	Rural (n_1=104)		Urban (n_2=32)		Total (n=136)	
	No. studied	No. of hypertensives	No. studied	No. of hypertensives	No. studied	No. of hypertensives
Daily	102	22 (21.56%)	31	15 (48.38%)	133	37 (27.81%)
Occasionally	2	0 0.00%	1	0 0.00%	3	0 0.00%
Total	104	22 -21.15%	32	15 (46.87%)	136	37 -27.20%
Chi-Square (df)	.557(2)		5.307(2)		1.331(2)	
P-value	0.757		0.07		0.514	

Table 4: Multivariate logistic regression analysis of predictors of hypertension in the total study sample

Predictor	β coeff	Odd's ratio	95%CI	P-value
Place (Rural=1, Urban=2)	-0.003	0.997	.628-1.58	0.99
Age (<40 yrs=1, >40yrs=2)	0.984	2.674	.833-3.90	**0**
Marital status (Married=1, Single=2)	0.045	1.047	.683-1.60	0.834
Religion (Hindu=1, Muslim=2)	0.484	1.623	.932-2.82	0.087
Socioeconomic status (Low=1, Better off=2)	0.396	1.485	.975-2.26	0.065
Body mass index (High=1, Normal=2)	-1.26	0.284	.179-0.44	**0**
Waist circumference (High=1, Normal=2)	0.163	1.177	.728-1.90	0.507
Waist hip ratio (Increased=1, Normal=2)	-0.875	0.417	.382-3.13	**0.001**
High fat intake (Yes=1, No=2)	0.235	1.265	.844-1.89	0.255
High salt intake (Yes=1, No=2)	1.417	4.124	.220-7.66	**0**
Adverse food intake (Yes=1, No=2)	-0.091	0.913	.541-1.54	0.734

Discussion

The prevalence of hypertension has been increasing in India, both in rural and urban regions. Factors which are attributable to these changes are rapid urbanization, lifestyle changes, dietary changes including use of fast foods and increasing salt intake and increased life expectancy. Similar trends were found in our study also.

The high prevalence of hypertension and pre-hypertension in the present study is similar to the trends reported worldwide. [2] Similar prevalence of pre-hypertension (47 per cent) has also been reported in the study conducted in Chennai among urban adults. [7]

The prevalence of hypertension was found to be higher in urban areas (30.8%) than rural areas (20.9%). Similar trends have been reported by other Indian studies. [19, 6]

The proportion of hypertension was found to increase steadily with the increase in age. These findings are coherent with studies carried in Wardha [20], Mizoram [21] and South India [22]. Such changes of blood pressure with age might be due to changes in vascular system

Higher proportion of divorced, ever married or widowed were found to be hypertensive as compared to those married and unmarried. Similar findings were reported by a study conducted in Assam. [23] Apparently psychosocial factors affect biological, neuroendocrine and immune systems. [24]

The percentage of hypertensives among the illiterate respondents was observed slightly higher as compared to the literate ones. However there was no significant association with education in the present study. Obviously the level of education is related to the protection of hypertension. Education was found to be significantly associated to hypertension in the Wardha study [20].

Higher prevalence of hypertension was found in upper, upper-middle and middle classes, as compared to lower-middle and lower classes. Similar findings were reported among Chennai urban adults belonging to the low socio economic group based on household, income, occupation (8.4%) as compared to prevalence in the middle socio economic group (15%). [25] Societies that are in transitional stage of economic and epidemiological change have higher prevalence of hypertension among upper socioeconomic groups. [3]

BMI was found to be significantly associated with hypertension. Persons having BMI more than or equal to 25 had a higher risk of hypertension. Similar findings were reported by studies conducted in Orissa [26] and West Bengal [27].

Higher proportion of centrally obese respondents (40%) were found hypertensive. Similar findings were reported by studies conducted in Maharashtra [11] and West Bengal [27]. Also a higher proportion of respondents with a high waist hip ratio (39.30% men and 30.12% women) were found hypertensive. Similar observations were reported in a study conducted in rural Wardha [20]. 38.5% of hypertensives had a waist-hip ratio equal to or more than the cut-off point, i.e. 0.8 for females and 0.9 for

males. Similar findings was observed by studies conducted in Gujarat [28] and West Bengal [27].

Although the prevalence of hypertension was higher among smokers as compared to non smokers, there was no significant association with smoking in our study. Smoking was found to be significantly associated to hypertension in the Maharasthra study [11].

Similarly, there was no association with smokeless tobacco use in our study as found in the studies conducted in Maharasthra [11], Mizoram [21] and Gujrat [28].

We also did not find any relationship between alcohol consumption and hypertension (P >0.05). Possibly most of our subjects did not consume alcohol. Alcohol was found to be significantly associated to hypertension in the studies conducted in Maharasthra [11], Assam [23], Orissa [26] and Mizoram [21]

Lower prevalence of hypertension was found among respondents who were physically active as compared to those who had a sedentary lifestyle. However there was no association with physical activity in our study as seen in the Wardha study [20]. The positive effect of physical training in both primary and secondary prevention of hypertension has been confirmed. [3]

In the study population a higher proportion of respondents with high fat intake were found hypertensive as compared to those with normal fat intake. Diet and nutrition have been linked to high blood pressure. Composite diets have been demonstrated to reduce the risk of hypertension. [29]

Higher proportion of respondents (71.42%) with high salt intake were found hypertensive. The similar findings were reported by the study conducted in Assam. [23] Salt intake has been directly correlated with prevalence of hypertension in many populations. [29]

We can have projections from the study that lifestyle modifications may lead to decrease in blood pressure of an individual. This study also emphasizes the need for large, nationwide, multicentric, prospective, and supervised epidemiological studies as presently there is an increase in cases of hypertension in our country.

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Original Research Article

A PREVALENCE STUDY ON MALNUTRITION AMONG ELDERLY PERSONS OF KANCHEEPURAM DISTRICT IN TAMILNADU

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Abstract

BACKGROUND: Under nutrition is still a major problem and elderly are highly vulnerable and are often neglected. Early diagnosis and timely intervention can arrest malnutrition at its incipient stage, so as to enable healthy and active ageing. **OBJECTIVES:** To estimate the burden of malnutrition and its associated factors among the elderly. **MATERIALS AND METHODS:** A community based cross sectional study was done among 487 elderly (60 years and above) in randomly selected areas of Kancheepuram district in 2016. Data was collected using an interview based questionnaire and nutritional assessment using Mini Nutrition Assessment and depression using Geriatric Depression Scale – Short Form.**RESULTS:** About 47.4% were at risk of malnutrition and 2.9% were malnourished. The proportion of malnutrition and at risk of malnutrition increases significantly with increasing age, female gender, who were single, widow and widower, who had no formal education, financially dependent only on Old Age Pension Scheme, living alone, belonging to lower socio economic class and with co-morbid conditions. Logistic regression revealed that the risk of developing malnutrition and at risk of malnutrition is significantly higher with increasing age (OR 2.35, CI – 1.28 - 4.32), female gender (OR 2.58, CI – 1.61 - 4.14), Depression (OR 6.02, CI – 3.9 to 9.3), Lower socio economic status (OR 3.99, CI – 2.48 - 6.4), Tobacco abuse (OR 2.38, CI – 1.18 - 4.79) and Arthritis (OR 1.99, CI – 1.05 - 3.78).**CONCLUSION:**A comprehensive nutritional screening is needed for elderly in the primary health care setting through geriatric clinics and nutritional screening may be done as part of NCD (Non Communicable Disease) Programme. Nutritional support for the elderly could be provided through existing ICDS (Integrated Child Development Scheme) centers.

KEYWORDS: At risk of malnutrition, Elderly, Malnutrition.

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Introduction

Malnutrition is a major problem worldwide. Children, Pregnant mothers and Elderly are vulnerable to malnutrition due to physiological and functional changes. The intervention programs are directed towards children and pregnant mothers and often elderly people are neglected.(1) But there has been a substantial rise in elderly population globally. In 2001, the proportion of older people was 7.7% which increased to 8.14% in 2011 and projected to be 8.94% in 2016.(2)Apart from malnutrition, the elderly suffer from multiple morbidities either communicable or non –communicable which worsens the nutritional status and in turn the nutritional status worsens the co-morbid conditions.(1)

The physiological changes of ageing like limited mobility, sensory impairment negatively affects the nutritional status. In contrast to younger age group,

the energy needs decreases with age but the need of nutrients remains the same which further increases the risk of malnutrition among elderly.[3]Restriction in the diet due to co-morbid conditions creates disinterest in food intake along with decreased physical activity and a progressive decrease in lean body mass impairs immunity which further increases the risk.

Not only the physiological changes, the psychological and environmental changes like isolation, depression and inadequate finances added on the risk.[4]At the global level, nearly half of all people who have reached statutory pensionable ages do not receive a pension, and for many of those who do receive a pension, the levels of support is still inadequate. In 2015, 30 per cent of men and 15 per cent of women who are 65 years or over were active in the labour force and this is more in the developing countries [5] making elderly more vulnerable to undernutrition.

Under nutrition is a public health problem among elderly which rises the mortality and morbidity by increasing the susceptibility to infection, increased risk of falls due to progressive depletion of lean body mass, increases the chances of hospitalization, longer stay in hospitals due to delayed recovery.[6] Malnutrition is associated with diminished cognitive function, the ability to care for one's self and limits mobility among elderly. Hence malnourished elderly needs health care and social services often posing a burden on caregivers and economic cost to society and to the country.[7]

Evaluation of nutritional status is important among elderly and early diagnosis and timely intervention can arrest malnutrition at its incipient stage to improve the health status of elderly for a healthy and active ageing which is our ultimate goal. Hence this study focus on the nutritional status of elderly and the presence of co-morbid conditions like diabetes, hypertension, chronic kidney disease, stroke etc., along with depression as malnutrition is a presenting symptom of depression in elderly.

Methodology

This was conducted as a community based cross sectional study among elderly (60 years and above) in selected areas in Kancheepuram district of Tamil Nadu from April 2016 to September 2016. The study was approved by the Institutional Ethics Committee of Madras Medical College vide IEC No:24062016.

Study procedure

The study procedure involved mapping of all villages in rural area and electoral wards in urban area of Kancheepuram. The areas were selected by simple random sampling technique and the individuals were selected from the household list available with the health nurse. Elderly who are resident and willing were enrolled in the study. Those not available on two consecutive visits and critically ill were excluded. Data was collected on an interview basis and the questionnaire had socio – demographic details, history of co-morbid conditions, anthropometry, nutritional assessment and depression scale. Each participant was given a brief introduction about the study and informed written consent was obtained from all participants (In illiterate elders, a thumbprint was taken in front of witnesses). Relevant information was obtained from the respondent using the Tamil version of the questionnaire at their homes. Questions were read out to the study subjects in exactly the same order as listed in the questionnaire and sufficient time was given to the subjects to respond. If the study subject haven't understood the question, the question was repeated in the same manner without probing for the answer. After completing the questions and viewed the health records based on the availability, anthropometry were measured.

The socio – demographic details included the name, age, sex, residence, religion, marital status, educational status, occupation, economic status, type of family, income of the family and total number of family members, Diet and Drug abuse. The details of co-morbid conditions were elicited from the history and the medical records available. Anthropometric tools: weighing machine (Weight measurement), stadiometer (Height measurement), measuring tape (Mid upper arm circumference, waist circumference, Hip circumference & Calf circumference measurement).

Nutritional assessment was done with Mini Nutritional Assessment (MNA) of Nestle Nutrition Institute which is a validated tool. Apart from Body

Mass Index (BMI), the mid – arm circumference and calf circumference were measured – easy and useful tool as a marker of malnutrition among elderly.[8]The mid upper arm circumference (MUAC) is a simple and valid measurement of thinness than BMI and have a strong association with mortality among elderly.[9]MNA has 18 questions to assess dietary intake, global indicators, anthropometric measurements (BMI, MUAC, Calf circumference (CC)) and self- perception on one's own nutritional status. MNA classification is based on scores: Scores of 24 – 30 are considered Normal; 17 – 23.5 indicate at risk of malnutrition; Less than 17 points indicate Malnutrition. The questions were probed using MNA guide.[10] The original validation study on the full MNA demonstrated the MNA had a sensitivity of 96%, specificity of 98% and positive predictive value of 97% compared to clinical status.[11]The presence of depression was assessed using Geriatric Depression Scale – Short Form (15 questions). Scores of 0-4 are considered normal.[12] The Tamil version by Cynthia Swarnalatha Srikesavan of the University of Manitoba, Canada was used.[13] The GDS was found to have a 92% sensitivity and 89% specificity when evaluated against diagnostic criteria.[14]

Data analysis: The responses were verified twice, entered and analyzed using IBM SPSS version 16.0. The descriptive and inferential statistics of the responses to the questions were calculated. A two tailed p value of <0.05 was considered as statistically significant.

Results

A total of 500 participants were approached and after excluding for non- respondents and partial responses – 487 were enrolled in the study. The mean age (S.D) was 65.47 (5.7) years. Young old (60-69 years) were 81.7%, Middle old (70-79 years) were 14.2% and Very old (80 years and above) were 4.1%.

Participants with normal nutritional status were 49.7%, 47.4% were at risk of malnutrition and 2.9% were malnourished (undernourished). The association of nutritional status and socio – demographic factors are shown in table 1 and 2.The

Table 1: Association between nutritional status and socio – demographic factors

Variables	Normal Nutrition Status N = 242	At risk of Malnutrition N = 231	Malnourished N = 14	Total N- 487	p - Value
Residence					
Rural	111 (44.8%)	127 (51.2%)	10 (4%)	248	**0.042*** $\chi2$= 6.350 df = 2
Urban	131 (54.8%)	104 (43.5%)	4 (1.7%)	239	
Age Category					
Young old	207 (52%)	186 (46.7%)	5 (1.3%)	398	**0.001*** (Fisher exact)
Middle old	29 (42%)	35 (50.7%)	5 (7.2%)	69	
Very old	6 (30%)	10 (50%)	4 (10%)	20	
Gender					
Male	137 (62.6%)	76 (34.7%)	6 (2.7%)	219	**0.001*** $\chi2$= 26.876 df = 2
Female	105 (39.2%)	155 (57.8%)	8 (3%)	268	
Marital Status					
Currently married	192 (59.1%)	126 (38.8%)	7 (2.2%)	325	**0.001*** (Fisher exact)
Widow	30 (25.9%)	81 (69.8%)	5 (4.3%)	116	
Widower	13 (35.1%)	23 (62.2%)	1 (2.7%)	37	
Separated	2 (100%)	0 (0)	0 (0)	2	
Single	5 (71.4%)	1 (14.3%)	1	7	
Educational Status					
No formal education	61 (33.3%)	115 (62.8%)	7 (3.8%)	183	**0.001*** (Fisher exact)
Primary education	59 (48.8%)	60 (49.6%)	2 (1.7%)	121	
Secondary education	31 (47%)	32 (48.5%)	3 (4.5%)	66	
Higher Secondary education	48 (67.6%)	22 (31%)	1 (1.4%)	71	
Diploma / Degree	43 (93.5%)	2 (4.3%)	1 (2.2%)	45	
Occupational Status					
Not working	120 (44.1%)	140 (51.5%)	12 (4.4%)	272	**0.001*** (Fisher exact)
Unskilled worker	42 (41.2%)	60 (58.8%)	0 (0)	102	
Semi - skilled worker	12 (52.2%)	9 (39.1%)	2 (8.7%)	23	
Skilled worker	9 (75%)	3 (25%)	0 (0)	12	
Shop owner / Land lord	56 (74.7%)	19 (25.3%)	0 (0)	75	
Professional	3 (100%)	0 (0)	0 (0)	3	
Dependency Status					
Independent	156 (61.2%)	95 (37.3%)	4 (1.6%)	255	**0.001*** (Fisher exact)
Dependent on Family members	82 (39%)	124 (59%)	4 (1.9%)	210	
Dependent only on OAP**	4 (18.2%)	12 (54.5%)	6 (27.3%)	22	
Living Status					
Living with Spouse	103 (65.2%)	53 (33.5%)	2 (1.3%)	158	**0.001*** (Fisher exact)
Living with Children	119 (44.7%)	141 (53%)	6 (2.3%)	266	
Alone	20 (31.7%)	37 (58.7%)	6 `22(9.5%	63	

*- p value – Significant. **- Old Age Pension from Government. df – Degree of freedom

Table 2: Association between nutritional status and socio – economic status and other associated factors

Socio Economic Status					
Upper class	78 (79.6%)	19 (19.4%)	1 (1%)	98	**0.001***
Upper middle class	53 (63.9%)	29 (34.9%)	1 (1.2%)	83	
Middle class	44 (40.7%)	61 (56.5%)	3 (2.8%)	108	(Fisher exact)
Lower middle class	56 (34.8%)	97 (60.2%)	8 (5%)	161	
Lower class	11 (29.7%)	25 (67.6%)	1 (2.7%)	37	
Diet					
Mixed diet	186 (46.3%)	206 (51.2%)	10 (2.5%)	402	**0.001***
Vegetarian diet	56 (65.9%)	25 (29.4%)	4 (4.7%)	85	(Fisher exact)
Tobacco Abuse					
Yes	22 (37.3%)	35 (59.3%)	2 (3.4%)	59	**0.091**
No	220 (51.4%)	196 (45.8%)	12 (2.8%)	428	(Fisher exact)
Alcohol Abuse					
Yes	28 (54.9%)	22 (43.1%)	1 (2%)	51	**0.842**
No	214 (49.1%)	209 (47.9%)	13 (3%)	436	(Fisher exact)
Body Mass Index					
Underweigh t	4 (14.8%)	19 (70.4%)	4 (14.8%)	27	**0.001***
Normal	128 (49.2%)	124 (47.7%)	8 (3.1%)	260	
Overweight / Obese	110 (55%)	88 (44%)	2 (1%)	200	(Fisher exact)
Waist – Hip ratio					
Normal	25 (44.6%)	29 (51.8%)	2 (3.6%)	56	**0.625**
Increased	217 (50.3%)	202 (46.9%)	12 (2.8%)	431	(Fisher exact)

***- p value – Significant. df – Degree of freedom.**

proportion of malnutrition and at risk of malnutrition is increased significantly in elderly of increasing age, female gender, rural residents, who were single, widow and widower, who had no formal education, financially dependent only on Indira Gandhi National Old Age Pension Scheme, living alone (table 1) and who belongs to lower socio economic class (table 2).

The proportion of malnutrition and at risk of malnutrition increases significantly with co – morbid conditions like Diabetes, Hypertension, Chronic Kidney Disease, Stroke, Depression etc., and also malnutrition increases as co – morbidities increases and is shown in Table no:3

Multi variate analysis:In Logistic regression, the individuals were divided into two groups – well-nourished and at risk of malnutrition / Malnourished. After adjusting for other factors it revealed that the

Table 3: Association of nutritional status and Co-morbid conditions

Variables	Normal Nutrition Status N = 242 (49.7%)	At risk of Malnutrition N = 231 (47.4%)	Malnourished N = 14 (2.9%)	Total N- 487	p - Value
Depression					
Yes	60 (25.6%)	163 (69.7%)	11 (4.7%)	234	**0.001*** $\chi2$= 104.563
No	182 (71.9%)	68 (26.9%)	3 (1.2%)	253	df = 2
Diabetes					
Yes	108 (54%)	81 (40.5%)	11 (5.5%)	200	**0.002*** $\chi2$= 12.843
No	134 (46.7%)	150 (52.3%)	3 (1%)	287	df = 2
Hypertension					
Yes	92 (46.9%)	93 (47.4%)	11 (5.6%)	196	**0.011*** $\chi2$= 9.051
No	150 (51.5%)	138 (47.4%)	3 (1%)	291	df = 2
Chronic Kidney Disease					
Yes	0 (0)	5 (83.3%)	1 (16.7%)	6	**0.015*** (Fisher exact)
No	242 (50.3%)	226 (47%)	13 (2.7%)	481	
Stroke					
Yes	0 (0)	3 (75%)	1 (25%)	4	**0.017*** (Fisher exact)
No	242 (50.1%)	228 (47.2%)	13 (2.7%)	483	
Arthritis					
Yes	24 (35.3%)	42 (61.8%)	2 (2.9%)	68	**0.028*** (Fisher exact)
No	218 (52%)	189 (45.1%)	12 (2.9%)	419	
COPD					
Yes	4 (36.4%)	4 (36.4%)	3 (27.3%)	11	**0.005*** (Fisher exact)
No	238 (50%)	227 (47.7%)	11 (2.3%)	476	
Tuberculosis					
Currently on ATT	0	1 (100%)	0	1	**0.16**
Old Cases	0	4 (100%)	0	4	
No	242 (50.2%)	226 (46.9%)	14 (2.9%)	482	(Fisher exact)
Ischemic Heart Disease					
Yes	18 (56.3%)	13 (40.6%)	1 (3.1%)	32	**0.588** (Fisher exact)
No	224 (49.2%)	218 (47.9%)	13 (2.9%)	455	
Cancer					
Yes	0	5 (100%)	0	5	**0.047*** (Fisher exact)
No	242 (50.2%)	226 (46.9%)	14 (2.9%)	482	
No. of Co - morbidities					
0 or 1	106 (43.1%)	138 (56.1%)	2 (0.8%)	246	**0.001*** (Fisher exact)
More than one	136 (56.4%)	93 (38.6%)	12 (5%)	241	

*** - p value - Significant. df – Degree of freedom**

Table 4:Independent risk factors for the risk of developing malnutrition and at risk of malnutrition

Variables	B	S.E	Wald	df	Sig	Exp(B)	95% C.I for Exp(B)	
							Lower	Upper
Age	0.855	0.31	7.602	1	0.006	2.352	1.281	4.321
Gender	0.948	0.241	15.485	1	0.001	2.58	1.609	4.137
Socio – economic status	1.383	0.242	32.72	1	0.001	3.986	2.482	6.401
Tobacco abuse	0.866	0.358	5.847	1	0.016	2.376	1.178	4.793
Arthritis	0.687	0.327	4.402	1	0.036	1.988	1.046	3.776
Depression	1.795	0.222	65.417	1	0.001	6.017	3.895	9.295

risk of developing malnutrition and at risk of malnutrition depends on increasing age (OR 2.35 times, CI – 1.28 to 4.32), female gender (OR 2.58 times, CI – 1.61 to 4.14), Lower socio economic status (OR 3.99 times, CI – 2.48 to 6.4), Tobacco abuse (OR 2.38 times, CI – 1.18 to 4.79),Depression (OR 6.02 times, CI – 3.9 to 9.3) and Arthritis (OR 1.99 times, CI – 1.05 to 3.78) shown in table 4.

Discussion

In the present study, malnutrition was determined using MNA among elderly. The prevalence of malnourished in our study was 2.9% which is lower than studies done in rural Tamilnadu – 14%[15], in Assam - 15%[1],in urban area of Coimbatore - 19.47%[16], in Dehradun- 20.83%[17]and the prevalence of malnutrition in our study is higher when compared to a study of rural Tamilnadu, where no one was malnourished.[18]In our study, the proportion of elderly at risk of malnutrition was 47.4% which is corroborated with some studies[15,17] and lower prevalence of at risk of malnutrition was shown by few studies.[16,18]According to BMI, 5.8% were underweight, 32.5% overweight and 8.1% were obese in our study. The proportion of obesity in our study corroborates with a study[17],but the proportion of underweight in our study is lower than these studies.[17,19]This may be due to the difference in life style and socio economic status.

The proportion of malnutrition increases with age in our study, which is consistent with some studies [1,15] and females are more affected than males in our study which is supported by some studies [1,20] but, no gender association was seen in anotherstudy.[15]

Among the social factors, lower socio economic status compared to upper class, single/ widow/ widower compared to married, people depending only on government old age pension scheme as financial assistance, living alone were significantly associated with at risk of malnutrition/ malnutrition. This implies that the nutritional status depends on multiple factors which is again supported by some studies.[1,15,16]

Malnutrition and at risk of malnutrition were significantly associated with co-morbid conditions like diabetes, hypertension, chronic kidney disease, stroke, arthritis, COPD, cancer and depression. The association of depression and malnutrition is supported by few studies.[20,21]No significant association was seen with current alcohol consumption, increased medications and increasing number of co-morbidities in our study and this is supported by a study.[16]

In logistic regression analysis, the independent risk factors associated with the risk of malnutrition and at risk of malnutrition were increasing age, female gender, lower socio economic status, tobacco abuse, arthritis and presence of depression. The association of increasing age, depression with malnutrition is supported by some studies.[20,21]

Conclusion

In this community based study, half of elderly people are at risk of malnutrition. It is evident that the causes are multifactorial. There was a significant association between malnutrition in the elderly and increasing age, female gender, lower socio economic status, financial dependency and substance abuse. Co-morbidities like depression and arthritis also have a significant negative effect on the nutritional status of the elderly.

These findings warrant for a comprehensive nutritional screening for elderly along with mental health services and health education in the primary health care settings, with proper referral and rehabilitative services must be ensured.

Limitations of the study

Co- morbidities were self – reported or medical report based. Bio – chemical markers were not studied to assess malnutrition.

Malnutrition among depressed is high but it's a chicken-and-egg phenomenon which could not be explained in this study.

Recommendations

Geriatric clinics may be set up at primary health centers and nutritional screening may be done as part of NCD (Non Communicable Disease) Programme. Nutritional support for the elderly belonging to BPL (Below Poverty Line) families could be provided through existing ICDS(Integrated Child Development Scheme) centers.

Further research is needed to develop appropriate guidelines for nutritional screening and interventional programs among geriatric population.

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Original Research Article

RELATIONSHIP BETWEEN PRE TREATMENT BACILLARY LOAD AND SMEAR CONVERSION AND TREATMENT OUTCOME OF PULMONARY TUBERCULOSIS PATIENTS IN A TB UNIT OF KARNATAKA

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Abstract

Background: Sputum smear microscopy is the key diagnostic tool used for case detection in RNTCP. **Objectives:** Among sputum smear positive pulmonary tuberculosis patients, 1. to study the relation between pre-treatment bacillary load and sputum smear conversion & 2. to study the relation between pre-treatment bacillary load and treatment outcome. **Methodology:** A prospective cohort study was conducted in Davangere TB unit, Karnataka. All sputum smear positive pulmonary tuberculosis patients registering under RNTCP in 2014 were interviewed using a structured questionnaire. **Results:** About 95.5% of the study subjects in Low Positive (LP) category finally achieved smear conversion, while only 87.4% of those in High Positive (HP) category could achieve the same (p=0.01). Favorable outcomes at the end of treatment were achieved by 73.6% of subjects in LP category as compared to only 60.7% of the HP category (p=0.01). **Conclusion:** A higher initial sputum smear grading of 3^+ was associated with lower conversion and cure rates.

Keywords: Pulmonary tuberculosis, Sputum smear grading, Sputum smear conversion, Treatment outcome

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Introduction

Diagnosis of pulmonary tuberculosis in RNTCP can be by performing sputum smear microscopy where the smears are stained for acid fast bacilli, graded and reported. Grading of smears is also used as supervisory tool under the program. This is meant to enhance the attention of the laboratory technician while reading the smears and also facilitates supervision by Senior TB Laboratory Supervisor. Smear grading depends upon the number of acid fast bacilli seen while examining the slides.[1]

RNTCP also recommends periodic sputum smear microscopy during the course of treatment to monitor patient progress and assess overall program performance.[1] Change in the bacteriological status of sputum of patients from initial AFB positive to AFB negative after treatment is referred to as sputum smear conversion.[2] Sputum conversion rate provides an objective evidence for the patient's response to therapy and thus the treatment outcome.[2] Hence the present study was carried out to study the relation between pre treatment bacillary load and sputum smear conversion as well as treatment outcome of sputum smear positive pulmonary tuberculosis patients.

Materials & Methods

This prospective cohort study was conducted in Davangere TB unit of Karnataka state in India. All sputum smear positive pulmonary TB patients aged above 15 years, diagnosed in all the six Designated Microscopic Centers of RNTCP from 1st January 2014 to 31st December 2014 and registering for DOTS were included in the study. Smear negative or extra-pulmonary TB patients were excluded. Institutional Ethical Committee approval was obtained prior to the study. After obtaining informed consent, subjects were interviewed using a pre-tested and structured questionnaire to collect information regarding socio-demographic variables, HIV status and sputum smear grading.

The spot and early morning sputum samples collected were subjected to quality sputum microscopic examination by smearing, staining and examining under the microscope for presence of acid fast bacilli. The smears were graded as scanty, 1^+, 2^+ or 3^+ as per RNTCP guidelines.[1] The bacteriological smear grading of the patients at the end of the intensive phase, extended intensive phase (if indicated) and continuation phase were also assessed as mentioned above. The outcome of the patients was ascertained as per RNTCP guidelines.[1] For the purpose of analysis, patients with pre-treatment sputum grading 3^+ were categorized as High Positive category (HP category). Those whose pre-treatment sputum smears were graded as 2^+, 1^+ or scanty were categorized as Low Positive category (LP category).

Data entry and analysis was done using Microsoft EXCEL 2010. Percentages and proportions were calculated. Chi square test was used for analyzing categorical variables. A *p* value below 0.05 was considered to be statistically significant.

Results

Totally 313 sputum smear positive pulmonary tuberculosis patients who registered under RNTCP in 2014 were included in the study. Their pre treatment smears graded as scanty, 1^+, 2^+ and 3^+ were 9 (2.9%), 102 (32.6%), 90 (28.8%) and 112 (35.8%) respectively. About 64.2% of them were in LP category, whereas 35.8% were in HP category. Among the socio demographic variables, majority of the study subjects were males (73.5%), aged below 60 years (84.3%), Hindus (80.8%) by religion and residing in urban localities (60.7%). Out of 313 pulmonary TB patients, 16 (5.1%) were found to be suffering from HIV. **[Table 1]**

Table 1: Association of pre treatment sputum smear grading with socio demographic variables.

Socio demographic variables	LP category n (%)	HP category n (%)	Total n (%)	*p* value	OR (95% CI)
AGE GROUP					0.67
Below 60 years	166 (82.6)	98 (87.5)	264 (84.3)		(0.34 – 1.32)
Above 60 years	35 (17.4)	14 (12.5)	49 (15.7)	0.25	
GENDER					0.91
Male	149 (74.1)	81 (72.3)	230 (73.5)		(0.54 – 1.53)
Female	52 (25.9)	31 (27.7)	83 (26.5)	0.72	
RELIGION					1.04
Hindu	163 (81.1)	90 (80.4)	253 (80.8)		(0.58 – 1.88)
Muslim	38 (18.9)	22 (19.6)	60 (19.2)	0.87	
DOMICILE					0.79
Rural	75 (37.3)	48 (42.9)	123 (39.3)		(0.49 – 1.27)
Urban	126 (62.7)	64 (57.1)	190 (60.7)	0.33	
HIV					0.8
Positive	11 (5.5)	5 (4.5)	16 (5.1)		(0.27 – 2.35)
Negative	190 (94.5)	107 (95.5)	297 (94.9)	0.69	

At the end of IP, it was observed that 84.0% of the subjects in the LP category had their sputum smears converted as compared to the same in the HP category (72.7%). Whereas conversion at the end of extended IP was 95.5% for LP category as compared to only 87.4% of the HP category. A higher pretreatment sputum smear grading was significantly associated with lower rates of smear conversion at the end of intensive (p=0.02) as well as extended intensive phase (p=0.01). **[Table 2]**

Among the 313 study subjects, the outcome of 207 (66.1%) were declared as cured and 9 (2.9%) as treatment completed at the end of treatment. About 37 (11.8%) study subjects were declared as lost to follow up, 15 (4.8%) as treatment failure, 37 (11.8%) died, 6 (1.9%) were switched to MDR-TB regimen, while 2 (0.6%) were transferred out.

The study subjects with pre treatment sputum smear grading of 3^+ (39.3%) were found to be significantly associated (p=0.01) with unfavorable outcomes when compared to study subjects with lower smear grading such as 2^+, 1^+ or scanty (26.4%) with a crude OR (95% CI) of 1.80 (1.10 – 2.95). **[Table 2]**

An attempt was also made to check the influence of smear conversion on treatment outcome. It was observed that smear conversion at the end of IP (p=0.000) as well as extended IP (p=0.000) was highly significantly associated with treatment outcome of pulmonary TB patients. Unfavorable outcomes were found to be more in those study subjects who failed to achieve smear conversion. **[Table 3]**

Table 2: Association of pre treatment sputum smear grading with conversion as well as treatment outcome.

Conversion & Outcome	LP category n (%)	HP category n (%)	Total n (%)	*p* value	OR (95% CI)
Conversion at end of IP					1.96
Yes	152 (84.0)	72 (72.7)	224 (80.0)		(1.08 – 3.56)
No	29 (16.0)	27 (27.3)	56 (20.0)	0.02	
Conversion at end of extended IP					3.09
Yes	171 (95.5)	83 (87.4)	254 (92.7)		(1.21 – 7.85)
No	8 (4.5)	12 (12.6)	20 (7.3)	0.01	
Outcome					1.8
Favorable	148 (73.6)	68 (60.7)	216 (69.0)		(1.10 – 2.95)
Unfavorable	53 (26.4)	44 (39.3)	97 (31.0)	0.01	

Table 3: Association of sputum smear conversion with treatment outcome.

Conversion	Favorable outcome n (%)	Unfavorable outcome n (%)	Total n (%)	*p* value	OR (95% CI)
Conversion at end of IP					3.45
Yes	184 (85.2)	40 (62.5)	224 (80.0)		(1.83 – 6.47)
No	32 (14.8)	24 (37.5)	56 (20.0)	0	
Conversion at end of extended IP					14.31
Yes	210 (97.7)	44 (74.6)	254 (92.7)		(4.94 – 41.4)
No	5 (2.3)	15 (25.4)	20 (7.3)	0	

Discussion

Pre-treatment sputum smear grading is a direct measure of bacillary load of the pulmonary TB patients. Available studies have highlighted the importance of initial sputum smear grading and its impact on smear conversion and treatment outcome.[3,4]

Gopi PG *et al* observed in their study that among those patients with positive smear at 2 months, 41.1% of the patients had a high (3^+) smear grading compared to 18.7% of patients with a lower (scanty or 1^+ or 2^+) smear grading. Significantly more patients (13.2%) remained smear positive at 3 months among those with a higher smear grading than that among patients with a lower smear grading (5.3%) (p<0.001). A significant decrease in conversion (p<0.001) as well as cure rate (p=0.01) was observed with increase in initial smear grading.[5]

Nwokeukwu H *et al* noted that conversion rate (p=0.03) and success rate (p=0.003) reduced significantly with increasing initial smear grading. Higher initial smear grading was significantly associated with poor outcomes such as default (p=0.009) and death (p=0.005) at the end of the treatment.[6]

Patel *et al* documented in their study that as the pretreatment sputum smear grade increased from scanty to 3^+, the proportion found smear-positive during follow-up increased by 2–3 times (p< 0.05).[7]

Dudala SR *et al* in Khammam TB unit observed that cure rate for patients with 3^+ smear grading was 80.33% while for patients with 1^+ grading was 94.05%. As the bacillary load increased, cure rate decreased (p=0.023).[8]

Similar findings were observed by Abhijit Mukherjee *et al* too.[9] But Behnaz et al observed that initial smear grading did not influence outcome, despite influencing smear conversion.[10] This may be due to cultural differences.

Operational advantages of smear examination over culture include: quick results, correlation with infectiousness & aid in identification of patients at high risk of death from tuberculosis if untreated.[2]

Studies also reveal that higher initial bacillary load and consistent smear positive status at the end of IP are significant risk factors for developing MDR TB.[11,12] In the era of drug resistant tuberculosis, the importance of higher initial smear grading should not be overlooked. These patients also continue to spread the infection for longer time and hence should be motivated to take appropriate cough etiquette measures.

Conclusion:

The present study revealed that patients in the HP category were at higher risk of achieving non conversion and unfavorable outcomes when

compared to patients in the LP category. This reiterates the importance of adequate cough hygiene as well as prioritizing these patients for drug resistance screening.

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Declaration

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Original Research Article

Determinants of Reproductive Tract Infection and cervical cytology among married women in Delhi

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Abstract

Background – Reproductive tract infection (RTI) represents a major public health problem in developing countries.The consequences of RTI's are several and may be severe in some cases. **Objectives** –To find out the prevalence of symptoms of RTI among the married women of 21-65 years, To identify clinical and cytological abnormalities among the symptomatic women, To find out association between socio-demographic profile and risk factors with RTI symptomatic and cytology positive patients. **Methods**: A total of 310 married women in age group 21-65yrs residing in Madanpur Khadar area of New Delhi, India, were screened for symptom suggestive of RTI; symptomatic women went through gynecological examination and cancer cervix screening by Pap smear.
Results –Overall, 34.5% of the study population had symptoms suggestive of RTI. Most of the symptomatic women (88%) had abnormal vaginal discharge. Among the symptomatic women, cytology proved that 64.6% were suffering from acute cervicitis, 3.9% from A Squamous Cell of Undetermined Significance (ASCUS) and 1.9%from Low Grade Intra epithelial Lesion (LSIL) Squamous. **Conclusion** – Prevalence of symptoms of RTI among women was found to be quite high(34.5%), and among them 1.9% had cervical dysplasia.

Key words: Reproductive tract infections, Risk factors, Cytology

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Introduction

Reproductive tract infection (RTI) represents a major public health problem in developing countries.[1]Some of the RTIs act as precursors for cancer cervix as reported in different studies, and thus may require prompt treatment.[2]

Cancer of the uterine cervix is the second most common cancer among women world-wide. In India this is the commonest cancer among women and this country has the largest burden of cervical cancer patients in the world. One out of every five women in the world suffering from this disease belongs to India. More than three-fourths of these patients are diagnosed at advanced stages leading to poor prospects of long-term survival and cure. Cervical Cancer can be prevented by screening women systematically through organized population based programmes. Regular population based screening using Pap smear cytology is the internationally

accepted screening method for cervical cancer. Pap smear based cervical screening has reduced Cervical Cancer incidence and mortality in different parts of the world.[3]

With the above-mentioned background, the present study was undertaken with the objectives to find out the prevalence of suggestive symptoms of RTI among the married women of 21-65 years, to identify clinical and cytological abnormalities among the symptomatic women, and to find out association between socio-demographic profile and risk factors with RTI symptomatic and cytology positive patients.

Materials and Methods

The present study was an observational, analytical epidemiological study with cross-sectional, community based design. It was conducted at Rural health training center, Madanpur Khadar, New Delhi India, which is the rural field practice area of Department of Community Medicine, Hamdard Institute of Medical Sciences and Research. The inclusion criteria consisted of ever-married women residing permanently in the study area in the age group 21-65years. The exclusion criteria were pregnant women, women within 6 weeks following delivery or abortion, women with already detected cancer cervix revealed from history or records, and women refusing consent. Study period was from January-June 2015.The Sample size was calculated based on a study about the prevalence of reproductive tract infections, which showed that the prevalence of symptoms for RTI was 36.8% among ever-married women of reproductive age group.[4]Applying formula $n = 4pq/L^2$, final sample size came out to be 310.

Study tools used were predesigned, pretested proforma, Cusco or Sim's speculum, Ayre's spatula, Koplik's jar, glass slides, ethyl alcohol, and gloves. Pap stain microscopy was performed by Department of Pathology, Hamdard Institute of Medical Sciences and Research, New Delhi. The study techniques were interview, clinical examination, gynecological examination, taking of Pap smear from the symptomatic women, and laboratory examination of the smear. Ethical clearance was sought from institutional ethical committee. Non-governmental organizations working in the area and associated with Rural health Training centre of Department of Community Medicine along with community level health workers were involved. With their help, IEC activities regarding RTI, cancer cervix were conducted in the study area to generate awareness regarding cancer cervix and importance of screening. Systematic random sampling method was adopted to choose the study subjects. Based on the survey data of the study area sampling interval was calculated for various blocks. The blocks were selected by random selection. In the selected block, first house was selected randomly and then the next woman was included according to the sampling interval.

The study population was interviewed with predesigned and pretested proforma to assess their socio-demographic characteristics and for presence of symptoms of RTI, operational definition of RTI used was presence of excessive white discharge; foul smelling itchy discharge; chronic lower abdominal pain; any ulcer, swelling, irritation around vaginal area; any other gynecological abnormality, etc. socio-economic status was assessed using the Revised Modified BG Prasad's Socio-economic classification scale, January 2014 based on Revised income categories for Delhi (IW) 2014.[5]

Symptomatic patients were requested to attend Rural health training centre, MadanpurKhadar on a pre-fixed date and time. A total of 107 symptomatic women were called for examination. Among them 102 came for clinical examination. Written consent was obtained from women, general and speculum examination was performed, and then Pap smear was obtained by aseptic technique from the squamo-columnar junction using an Ayre spatula. Smears were fixed in 1:1 ethyl alcohol and were given to the pathologist for staining by Papanicolaou technique and reporting. The screening results were shared with the participants with complete explanation of positive and negative results. Those requiring further investigation or management were referred to higher centres. The data was tabulated in SPSS version 16.0 (Chicago, SPSS Inc) and analyzed for simple proportions; Test of significance and logistic regression were performed.

Results

Of the total 310 women studied, 107(34.5%) women were symptomatic for RTI. Majority of them, that is, 94(88%) had history of abnormal vaginal discharge and 13(12%) women had history of chronic lower abdominal pain. Of the 107 symptomatic women, 102 had come for examination in the rural hospital with a response rate of (95.3%).Among the 310 study participants, majority, that is, 238(76.7%) belonged to the age group of 21–39 years; 259(83.5%) were literate; 229(73.8%) belonged to nuclear families; 158(50.9%) had three or more children;263 (84.8%) were homemakers; 269(86.7%) belonged to lower socio-economic classes, that is, classes III,IV and V of Revised modified BG Prasad' socio-economic classification scale, January 2014,and 243 (78.4%) were Hindus.

Women of 21–39 year age group, illiterate, belonging to joint family, having <3 children, homemakers, higher socio-economic status, and belonging to Muslim religion were proportionately more symptomatic. Association with education of woman was found to be statistically significant at p value of 0.05.Within the study sample 281(90.6%) women were married below 18 years of age**;**274 (88.4%) had teenage pregnancy and 250(80.6%) had improper menstrual hygiene, that is, used old washed cloth.

Regarding contraceptive use for past 1 year, 34 (10.9%) used barrier method as contraceptive; 18 (5.8%) had copper T inserted; 40(12.9%) had history of oral contraceptive pills (OCP) usage. Among the sample 62 women (20%) reported undergoing an abortion in the past and 8(2.6%) told contact history of husband with partner/s other than wife. Women with higher age at marriage, age of conception >19yrs, poor menstrual hygiene, and non-usage of barrier or OCP, in situ intra uterine device (IUD), history of abortion and positive contact history were proportionately more symptomatic. Menstrual hygiene, history of IUD insertion and history of abortion were found to be significantly associated with being symptomatic for RTI at a p value of 0.05

Table 1: Distribution of Socio-demographic variables, risk factors for RTI in the study population (n=310)

Agegroup in yrs	Symptomatic Frequency(%)	Asymptomatic Frequency(%)	Statistical tests
21-39	98(41.2)	140(58.8)	OR=0.204(0.097-0.430)
40-65	9(12.5)	63(87.5)	P<0.05
Education of woman			
Literate	83 (32.0)	176 (68.0)	OR=1.885(1.026-3.464)
Illiterate	24 (47.1)	27 (52.9)	P=0.05
Type of family			
Nuclear	77(33.6)	152(66.4)	1.16(0.685-1.968)
Joint	30(37.0)	51(63.0)	P>0.05
Number of children			
<3	61(40.1)	91(59.9)	0.613(0.382-0.983)
>3	46(29.1)	112(70.9)	P<0.05
Socio-economic status			
1(1,2)	21(51.2)	20(48.8)	OR=0.448(0.230-0.869)
2(3,4,5)	86(32)	183(68)	P<0.05
Religion			
Hindu	80(32.9)	163(67.1)	1.375(0.788-2.4)
Muslim	27(40.3)	40(59.7)	P>0.05
Age of conception			
<19yrs	94(34.3)	180(65.7)	OR=1.082(0.525-2.23)
>19yrs	13(36.1)	23(63.9)	P>0.05
Age at marriage			
<18yrs	95(33.8)	186(66.2)	OR=1.38(0.63-3.01)
>18yrs	12(41.4)	17(58.6)	P>0.05
Menstrual hygiene			
Not using cloth	14(23.3)	46(76.7)	OR=1.946(1.015-3.732)
Using cloth	93(37.2)	157(62.8)	P<0.05
Use of barrier method			
No	103(37.3)	173(62.7)	OR=0.22(0.07-0.65)
Yes	4(11.8)	30(88.2)	P<0.05
h/o IUD insertion			
No	95(32.5)	197(67.5)	OR=4.14(1.51-11.38)
Yes	12(66.7)	6(33.3)	P<0.05
OCP use			
No	91(33.7)	179(66.3)	OR=1.311(0.664-2.591)
Yes	16(40)	24(60)	p>0.05
h/o Abortion			
Not done	78(31.5)	170(68.5)	OR=1.9(1.08-3.3)
Done	29(46.8)	33(53.2)	P<0.05
Contact h/o husband			
No	102(33.8)	200(66.2)	OR=3.268(0.766-13.94)
Yes	5(62.5)	3(37.5)	P=0.13

Table 2 shows that on speculum examination, cervical discharge was seen in 78(76.5%), and erosion in 3(2.9%), whereas Pap smear examination revealed dysplasia in 6(5.8%) and acute cervicitis in 66(64.6%) of the respondents. Of the total slides examined, 11(10.8%) slides were found unsatisfactory for evaluation. On multivariate logistic regression analysis among the attributes which were found to be significantly associated on univariate analysis in table 1 shows that history of

IUD insertion and history of abortion were found to be statistically significant at a p value<0.05.

Table 2: Distribution of RTI symptomatic women according to their clinical and cytological findings (*n* = 102)

Type of examination/classification	Number	%
Speculum examination		
Normal	18	17.6
White discharge	78	76.5
Erosion	3	2.9
Prolapse	1	0.9
Cervicitis	2	1.9
Pap Smear findings		
Unsatisfactory for evaluation	11	10.8
Bethesda system		
ASCUS	4	3.9
LSIL	2	1.9
Benign inflammatory lesion		
NILM	19	18.6
NILM-mild	24	23.5
NILM-moderate	26	25.4
NILM-severe	16	15.7

Table 3: Logistic regression analysis of the attributes found significantly associated with being symptomatic in univariate analysis

Attribute	B	SE	Df	Sig.	Exp (B)
Education	-0.494	0.325	1	0.128	0.61
Menstrual hygiene	-0.461	0.344	1	0.18	0.631
IUD	-1.409	0.526	1	0.007	0.244
Abortion	0.689	0.296	1	0.02	1.991
Constant	1.022	0.571	1	0.074	2.779

2 log likelihood ratio=380.250; Cox & Snell R square=0.060

symptomatic women tested for cytology and reporting cytology positive i.e showing acute cervicitis or cervical dysplasia including LSIL and ASCUS of Bethesda classification were more in the age group 40-65 years, those having three or more children, not using of barrier method ,not using cloth during menstruation, having no history of abortion and non-users of OCP. From the logistic regression (Table 3), it is clear that IUD and abortion have significant relationship with being symptomatic. Although, other factors was not identified significant relative to being symptomatic but the constant value suggest that id education and hygiene factor will increase being symptomatic will decrease strongly.

Table 4: Distribution of the symptomatic according to socio-demographic and risk factors with cytology results (*n* = 91)

Variables	Cytology negative	Cytology positive	Statistical tests
Age			
21-39	18(21.7)	65(78.3)	p>0.05
40-65	1(12.5)	7(87.5)	OR=1.938(0.224-16.79)
Number of children			
<3	11(21.6)	40(78.4)	p>0.05
>3	8(20)	32(80)	OR=1.1(0.396-3.058)
Use of barrier method			
No	18(20.7)	69(79.3)	p>0.05
Yes	1(25.0)	3(75.0)	OR=0.783(0.077-
Contact h/o husband			
No	19(21.1)	71(78.9)	p>0.05
Yes	0(0)	1(100)	OR=0.789(0.709-0.878)
IUD			
No	19(22.9)	64(77.1)	p>0.05
Yes	0(0)	8(100)	OR=0.771(0.686-
Menstrual hygiene			
Not using cloth	2(16.7)	10(83.3)	p>0.05
Using cloth	17(21.5)	62(78.5)	OR=0.729(0.146-0.365)
Abortion			
Not done	12(17.1)	58(82.9)	p>0.05
Done	7(33.3)	14(66.7)	OR=0.414(0.138-1.243)
OCP use			
No	13(17.3)	62(82.7)	p>0.05
Yes	6(37.5)	10(62.5)	OR=0.349(0.108-

Discussion

According to the present study the prevalence of symptoms suggestive of RTI was 34.5%, however in other studies it was observed to be 36.8%[4,]43.9%[6] and 59.8%[7].In this study, the prevalence of symptoms suggestive RTIs/STIs was found higher in comparison to other studies from India such as lowest prevalence was reported in Ludhiana at 17.3%[8] while in Karnataka a higher prevalence was found i.e. 40.4% and also 43.3% in Kolkata[10].The variability can be attributed to differing sample size, age group studied and the approach followed for diagnosis of RTI.

In the present study, most common symptom was abnormal white vaginal discharge, which corroborated with the findings of several studies[10, 11, 7, 12]In the present research, poor menstrual hygiene, history of intra uterine device insertion and a previous history of abortion were found to be significantly associated with symptoms of reproductive tract infection. These variables were also found linked with RTI in study done in a rural community of West Bengal[12]in Delhi[6]and Meerut [13].

In our research among all the samples studied for cytology (102), higher number had white discharge(76.5%) as compared to study done at Kolkata[12].According to Bethesda system of classification ,the prevalence of ASCUS was 3.9% which was lower [12] than observed in other studies and LSIL was 1.9% which was again lower than observed by other studies[12].The prevalence of benign inflammatory lesion was reported to be much higher (64.6%) in the present study as compared to others[7,12].Benign inflammatory changes are the most common cytological changes seen in the presence of RTI as observed in other studies also.

Cytology positive women were seen to be higher among women belonging to older age group, having>3 children, having a history of IUD insertion and practicing poor menstrual hygiene. This was also found among studies[7,12] from other areas.

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Original Research Article

Birth Spacing: Women's Knowledge, Methods Adopted and Barriers - A study from Urban Tamil Nadu

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Abstract

Back ground: WHO recommends a spacing of 2 to 3 years between births as it reduces the risk of infant and child mortality and maternal morbidity. Recent data shows that adoption of temporary methods are very low and discontinuation rates are high. This study explores women's knowledge on birth spacing, reasons for poor adoption of temporary contraceptives and barriers in using it. **Materials and methods:** It is a cross-sectional study conducted in a tertiary maternity hospital with 270 women who had delivered their second, third and above child were interviewed using a questionnaire. **Results:** Among all 39% had a birth interval <2years between 1st and 2nd child**.** Almost 60% of women knew that a birth interval of three years is required, for improving the health of the mother and for taking care of the previous child. Copper-T (95.2%)and Oral Pills (24.8%) were known, yet not preferred because of the side effects (65%) and condoms known (38%), but not preferred mainly because of poor spousal support(40%). The other methods were least known. Abortion was also considered as a method of contraception (5.2%). Doctors were the main source of information about temporary methods of contraception (73.3%). Forty three percent had adopted temporary contraceptives of which 66% had used Copper-T and 28% condoms, however discontinuation rates within 3years was 90%. Low perceived risk of pregnancy (53%), inadequate knowledge and fear of side effects of the contraceptive (27%), abortion as an option in case of conception (6%) and lack of spousal support (14%) were reasons for not adopting contraceptives. **Conclusion:** Knowledge on birth spacing is high yet observed birth interval was less. Wide knowledge-preference-practice gap in use of temporary contraceptives exists. Health-care providers should educate couples on the process of conception, need for spacing births, risks of induced abortions and promote use of temporary contraceptives giving various options.

Key words: Birth spacing, Contraceptives, Abortion

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Introduction

Tamil Nadu is one of the socially and economically progressive states in India with a population of 72 million, 48% urban and 52% rural. According to the 2011 census the literacy rate of the state is 80.3%, 86.8% for males and 73.8% for females.[1]The state fairs well in terms of indicators related to maternal and child health and has achieved a below-replacement total fertility rate of 1.8, with a contraceptive prevalence rate of 61.1%.[2] This is because the main focus of the family planning programme is on permanent sterilization and that too on female sterilization. However, spacing between births appears as an issue of concern. NFHS-3 data shows that 26% of the births occur within 24 months and 59% within 3 years[2]. SRS 2012, also gives a more or less a similar picture – 57.4% births had a birth interval less than the recommended period of 3 years[3]. After a live birth, the recommended interval before attempting for the next pregnancy should be at least 24 months as it reduces the risk of adverse maternal, peri-natal and infant health outcomes and in addition helps to breastfeed up to 2years as per UNICEF's recommendation.[4]

According to DLHS 4, all the spacing methods together account for just around 2.7% compared to 50.6% by female sterilizations[5]. Few studies report that pregnancies are terminated to space births[6,7].Reports from NFHS-4 reveals that adoption of temporary methods is very low in the state with only 0.4% using Oral contraceptive pills (OCPs), 2.3% Intrauterine devices (IUDs) and 2.1% condoms and the unmet need for spacing is 5.13%[8]. High discontinuation rates of contraceptive use are also observed in Tamilnadu[6]. Studies across India have shown that the common reason for women seeking abortions is to limit or space births irrespective of the sex of the children.[7]

In this context, the present study was designed with an objective to understand women's knowledge on birth spacing, preferences and adoption of temporary methods and barriers in spacing births. Such information is cruc ial to educate women on the importance of birth spacing, and to promote temporary methods of contraception and to recommend strategies to increase birth spacing as it has a direct impact on maternal and infant mortality and morbidity.

Materials and Methods

This was a Cross-sectional study conducted at Institute of Social Obstetrics, Kasturba Gandhi Hospital and Government Hospital (ISOKGH&GH) a tertiary care hospital located at Chennai. The study was taken up with recently delivered mothers, and information was obtained about their knowledge and perception on spacing methods, methods adopted by them and the barriers they had in spacing their previous births.

Sample Size: Assuming that 59% of the women deliver with a birth interval of less than 3yrs. (NFHS-3)[2] with 95% confidence interval and an allowable error of 10%, the estimated sample size was 267, which was rounded to 270.

Study participants: Two hundred and seventy mothers who had delivered their second, third and above child in ISOKGH &GH between May and June 2016 were the study participants. All women who had delivered from 1st May 2016 onwards were included in the study till the required sample size was reached by end of June 2016, excluding women who were not willing to participate in the study which was about 5%.

Exclusion Criteria: Motherswho had a still birth/ death of a child between the present and previous childbirth was excluded from the study , as the possibility of adopting a spacing method by them is very low as they would want another child.

Study instrument: The study participants were interviewed by the authors using a pretested semi-structured questionnaire.

Field definition: Birth spacing: For the study purpose birth spacing refers to the time interval from one child's birth date until the next child's birth date.

Ethics: Informed written consent was obtained from all the study participants. On completion of the interview with the questionnaire, women were briefed on the need for spacing births and the various methods available. Ethical clearance was obtained from the Institutional Ethical Committee of the Government Medical College, Omandurar Government Estate, Chennai.

Results

Two hundred and seventy women who had their 2nd, 3rd or more delivery at ISOKGH&GH between May and June 2016 were the study participants.

1. **General Information:**

Fifty percent of the women were in the age group of 26-30yrs, another 40% were between 20-25yrs and the remaining were above 30yrs. Ninety five percent of the women were literate and 69% of them had completed their high school education. Ninety six percent of the women were house wives and the remaining were self-employed or skilled workers. 17.8% of the women had been married before 18 years. Ninety two percent had delivered their second child and the remaining had delivered their third child. The spouses of these women were mainly in the age group of 26-30yrs – 49%, 32% were between 31-35yrs, 6.7% were less than 25yrs and 13% were above 35yrs. Ninety five percent of the spouses were literate and 70% of them have completed their high school education. Majority of the spouses were skilled workers -44%, the others were labourers-18.1%, self-employed-11.9%, clerical jobs and professionals -3.3%. Sixty nine percent of them belonged to the Nuclear families and remaining were from joint families. The Socio-economic status of the study participants was assessed using the BG Prasad's modified scale and most of them belonged to class 3&4.

2. Knowledge

Almost 90% of the woman knew that a birth interval of two to three years or more is required. Details of the birth interval suggested is given in Table-1,The main reasons quoted for spacing births is to take care of the previous child (67%) and for better health of the mother and new-born (21.9%).

Table – 1, Knowledge of Women on Birth Interval Required

S.No:	Birth Interval required	No: of mothers (%)
1	1 - 2 yrs	27 (10%)
2	2 - 3 yrs	80 (29.6%)
3	3 - 4 yrs	100 (37%)
4	> 4 yrs	63 (23.4%)
	Total	**270 (100%)**

Copper-T was the most popular method followed by condoms and Oral contraceptive pills [OCPs]. Abortion was also considered as a method of contraception. Details of the knowledge about temporary contraceptives are given in Table-2. The sources of information about contraceptives were Doctors (73.3%) nurses (8.9%), Mass media (10%) and friends (1.9%)

3.Temporary methods- Reasons for Preference & Problems expected

Only 5 women knew safe period could be followed as a method of contraception, but only 3 preferred it as it is natural method and the other two felt it was difficult to follow. Among 257 women who knew about Copper-T, only 89 preferred it, as it was considered to be effective (45), safe to use (12) and removable (32). The remaining did not prefer because of side effects like excess bleeding (26%), abdominal pain (17%), irregular menstruation (53%) and displacement (4%).

Among 67 women who knew about OCPs, only 7 preferred it as it requires spousal support. The others feared of the side effects like headache and weight and the possibility of forgetting to take it. Only 5 knew about EOCPs, yet did not prefer and considered it unreliable. Though 97 women knew about condoms, only 35 preferred to use it as it was safe to use (21), No side effects (11) and painless (3). The remaining knew yet did not prefer because of poor spousal support (39), fear of tear/slip (11), high failure rate (8) and difficulty in keeping it at home (4).

Table-2. Temporary methods of Contraception known to Women

S.No:	Contraceptive	No: of Women (in%*)
1	Copper- T	257(95.2%)
2	Condoms	97(35.9%)
3	OCPs	67(24.8)
4	Abortion	14(5.2%)
5	Natural method (following Safe Period)	5(1.9%)
5	Emergency Oral Contraceptive Pills (EOCPS)	5 (1.9%)
7	Injectable contraceptives	2(0.7%)

*Total would exceed 100% since some women knew about one or more methods

4. Birth Interval & Methods Adopted

Of the 270 women, 242 women had delivered their second child and remaining had delivered their 3rd child. Not a single mother had her 4th or more delivery. Thirty nine percent of the women had a birth interval (BI) of less than 2 yrs, and 66% less than 3yrs between their 1st and 2nd child. Only 43% had adopted some method of contraception to space their births. Copper-T was the most adopted – 66% followed by condoms - 28% and others were much less. The discontinuation rates by 2 years were high for both Copper-T and Condoms – 57% and 87% respectively. Of the 28 women who had delivered their 3rd child, 10 had a BI of less than 3 years and 6 less than 2yrs. 13 of them used Copper-T, OPs& one used condom.

5. Barriers

i. Spacing between the 1st and 2nd Child:

116 women adopted one or the other contraceptive method of which 105 discontinued before 3yrs. Four out of 6 women who followed safe period discontinued due to poor spousal support. Among women who used copper-T, 66 discontinued for reasons like bleeding (17%), abdominal pain and discomfort (20%), Irregular menstruation (21%) and the remaining wanted another child. Of the 4 women, who had used OCPs 2 discontinued because

of the side effects and the other two missed to take it regularly. Fifteen out of the 30 condoms users discontinued due to lack of spousal support, another 12 had difficulty in keeping it at home and the remaining wanted another child.

One hundred and fifty-four women did not adopt any contraceptive between the 1st and 2nd child. Low perceived risk of pregnancy and poor knowledge on return of fertility was the main reason for not adopting any contraceptive (53%). The other reasons for not adopting any contraceptive is given in Table-3

Table-3. Reasons for not adopting any Contraceptive

S.No	Reasons for not adopting any contraceptive	Women (%)
1	Low perceived risk of pregnancy & lack of knowledge on return of fertility	53%
2	Side effects of contraceptives	16%
3	Abortion as an option in case of conception	6%
4	Poor knowledge on use of contraceptives	11%
5	Lack of spousal support	14%
	Total	**100**

ii. Spacing between the 2nd and 3rd Child:

Of the 28 women who had delivered their 3rd child, 13 used Cu T, 3 OCPs & one used condoms. Among the 17 contraceptive users, 2 who used Copper T, and 3 who used OCPs discontinued because of the side effects.

6. Abortion

Seventeen percent of the women had an abortion between the first and second child of which 61% had induced abortion and the remaining was spontaneous. The main reason for an induced abortion is to take care of the previous child which was very small (78%) and the other reason was poor health of the women to continue the pregnancy (18%). Among the 28 women who had their 3rd delivery, 6 had an induced abortion once and this was to take care of the previous child.

7.Male participation is spacing births

Birth spacing / using a contraceptive was mainly a responsibility of women (51%) and 29% did not discuss it with their spouses. Women were asked to discontinue contraceptive in case of complaints (14%) and 6% reported poor spousal support for use of condoms (6%).

Discussion

Gen information

Ninety percent of the mothers were between the age group of 20 to 30yrs, which is normally expected. The literacy rate of women (98.4 %) and their spouses (96%) was higher than State's literacy rate – 73.44% &86.77%.Womenwho were married before18yrs were17.8%, this was higher than the State's data from NFHS-4 –13%. Almost ninety percent of the mothers had delivered their 2nd child, while the remaining had delivered their 3rd child. Not a single mother had come for their 3rd or more delivery. Such a scenario is possible in view of the low fertility rate of the state - 1.8.

I. Knowledge

i. Birth Interval

Most of the women knew that a BI of 2 -3 years, is required to take care of the previous child and for the health of the mother and new born as observed in other studies[9,10], unlike few studies where women's knowledge score on birth spacing was less[11].Literate mothers knew more about the importance of about birth spacing as seen in other studies[9,12].

ii. Temporary Methods of Contraception

Adequate knowledge on temporary methods of contraception among women is crucial to space births. Our study findings show that all women knew at least one or the other temporary contraceptive methods, yet knowledge on individual methods varied widely. Except for Copper- T, the knowledge levels on OCPs and condoms was found to be low as observed in many studies.[9,12] Natural methods, injectable contraceptives and EOCPS were least known by our study participants contrary to few studies where women had a good knowledge on these methods[9,12,13]

All the temporary methods of contraceptives including EOCPs are freely available in all the public health institutions in the state even in the Primary Health Centres yet a big knowledge gap seems to exist which has to be addressed. Even in Kerala a state with a high literacy rate, only 70% knew about temporary methods of contraception.[10]A recent study from Tamilnadu shows that providing information booklet and health education to women has improved knowledge and utilisation.[11]

A study from Tamil Nadu revealed that 87% women considered abstinence as a spacing option[14,] contrary to our findings were none considered it as an option. Five percent of women in our study have mentioned induced abortion as a method of contraception, similar to a study findings from Nagpur (11.7%)[9].

iii. Source of information about spacing Methods

Our study findings show that doctors were the main source of information about contraceptives followed by health workers and that media had a relatively less role as observed in a study from Pudhucherry,[15] but contrary to this another study from Tamil Nadu projects media as the main source of information as seen in rural Maharashtra also[9,16]. A study from Andhra Pradesh shows that family and friends have been the main source of information about contraceptives (67.8%), mass media was the next(8.8%) , while health personnel was the least (4%)[17]. As the source of information varies from place to place family planning programmes should strengthen their communication network and deliver information through multiple sources.

II. Temporary Methods of Contraception – Reasons for Preference &Barriers for preferring

i. Reasons for preference

Most of the studies done have been assessing women on their knowledge on contraceptives and comparing it with practice. In addition to knowledge, our study looked into preference/ non-preference for each of the temporary method and the barriers in using it, as it is essential to plan and promote spacing methods. Copper-T and Condoms seemed to be relatively preferred as seen in other studies[15]. Copper-T was preferred as it is safe, effective and removable and condoms as it is safe and painless.EOCPS and natural methods were least preferred.

ii. Barriers in preferring

Spousal support was a main barrier in adopting spacing methods, while women not opting for Copper-T were because of the side effects like excessive bleeding, irregular menstruation, abdominal pain and also the possibility of displacement. OCPs were also not the choice of women as they were concerned about the side effects of vomiting, head ache and weight gain and also fear that they might forget to take it routinely, such fear of side effects and belief that contraceptives affect the health of the women have been observed in may studies.[9,18,19]Though women preferred condoms the problems were that it requires the support of the husband and the difficulty in keeping it safe at home. Fear of tear/ slipping of condoms were other reasons mentioned. Poor support from male partners was found to be universal. [20 -22]

III. Birth Interval and Method Adopted

Short birth interval is observed in spite of the high literacy level. Attitude of educated women is believed to be in favour of adequate spacing but actual practice seems to differ. A study from Bangladeshh as also come out with similar findings that short birth intervals were observed in women with higher education.[23]Studies have shown that neonatal and infant mortality is highest for birth to pregnancy intervals of 18 months and is slightly increased for 18 -27 months[24]. Studies demonstrate that a birth interval of 3 to 5 years could increase chances of infant and maternal survival by 2.5 times more than children born at an interval of 2 years or fewer[15]. Pregnancy intervals of less than 6 months are associated with an increased risk of preterm births, low birth weight and small for gestational age. It also has a negative impact on the health of the mothers as she will not have enough time to recuperate from her pregnancy and her nutritional reserves would be depleted due to pregnancy, child birth and lactation[11].

Only 43% had adopted some method of contraception. Copper-T was the most adopted method followed by condoms and others were much less. Less adoption of temporary methods and high discontinuation rates have been observed in other studies also.[13,19]A positive trend was witnessed in a study from Maharashtra where more than 50% had adopted spacing methods like condom and Copper-T with very low discontinuation rates[14]. Study findings show a wide gap exists between the actual knowledge, preference and use of contraceptive methods as seen in other studies from different parts of India.[8,14, 18]

IV. Barriers in adopting spacing methods

Though side effects of the contraceptives and lack of support from husband and health issues were mentioned as reasons the main reason was low perceived risk of pregnancy and lack of knowledge of return to fertility. Similar findings have been observed and discussed in few studies.[21,25-27]Common reasons mentioned in other studies like preference for son, family pressure and lack of

access to contraceptive were not observed in the present study.[8,12-14]Study findings showed that Birth spacing / using a contraceptive was mainly a responsibility of women, which was not discussed many times between the couple.

V. Abortion

Induced abortion has been considered by women as method to avoid unwanted pregnancy.

The main reason for terminating pregnancy is to take care of the previous child which is still small and mother's own health as observed in another study from Kancheepuram district. However this study also mentions that limiting family size and poor economic status of the family were other reasons for induced abortion.[21].Another population based study in India also concludes that unintended pregnancies rather than sex of the previous child have been the reason for abortion. The study adds that rising educational levels of women may be the reason for increase in abortions.[7]

Findings of a survey done in Tamil Nadu by the Department of Population studies, Coimbatore in 2004, shows that chance of inducing abortion increases with the order of birth and urban women start inducing pregnancies at lower order of pregnancy compared to rural women. Induced abortions are being used as a method of contraception or as a backup to temporary methods of contraception.[28]

Limitations of the study

Information related to birth spacing between the 2nd and 3rd child may not give a complete picture since only 28 out of the 270 study participants were women who had their third delivery.

Conclusion

Knowledge on the importance of birth spacing among women was found to be high yet the birth intervals were less. Knowledge of Copper-T was high followed by condoms and OCPs. Women hardly knew about other spacing methods. Mere knowledge does not seem to guarantee use. Discontinuation rates of contraceptives were also found to be high. Side effects of the contraceptives, misconceptions about contraceptive use, low perceived risk of pregnancy and lack of knowledge of return to fertility and poor spousal support have been the reasons for not adopting spacing methods. Induced abortion is considered as a method of contraception and is considered as a backup in case of conception.

Lack of spousal support is also a major barrier in spacing births; this is because of poor participation of men in reproductive health[29]. The concept of male involvement in maternal health is now being advocated as an essential element of World Health Organization's initiative for making pregnancy safer and various studies have highlighted the importance of involving men in Family Planning, a probable solution to help women get spousal support and to make men understand their responsbilities.[29,30]Health Planners should develop strategies to promote use of temporary contraceptives by involving men and making focused couple counselling in all health facilities as an integral part of Family Welfare Programme. Such counselling sessions should be used to educate couples on the process of conception, importance of birth spacing, risks of induced abortion and information on the various contraceptives available including the natural methods and ECOPs, giving them an option to choose what suits them. In addition, counselling should help to clear the prevailing misconceptions and support women coming with problems while using a contraceptive. Appropriate Health messages should be disseminated through mass media and all public health facilities should arrange for easy access to contraceptives. A multi-pronged approach is therefore needed to translate women knowledge on birth spacing into practice.

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